# Energy- and Money-Saving Tips

# Tips

OVER

350

ENERGY- AND MONEY-SAVING TIPS

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# Contents

# Introduction

ARE YOU LOOKING FOR WAYS TO REDUCE ENERGY USE AROUND YOUR HOME AND ON THE ROAD? It's the little things that count: shut off the lights when you leave a room, turn off your computer at night, regularly clean the coils on the back of your refrigerator and check your vehicle's tire pressure. Together, actions such as these help you save money and protect the environment. After all, the less energy we use, the fewer air pollutants and greenhouse gas emissions we produce that contribute to climate change.

# Start Saving!

This booklet contains hundreds of helpful energy- and money-saving hints. Flip through and you'll find valuable information on the causes of energy loss as well as facts on EnerGuide and ENERGY STAR® that will help you shop for a new vehicle, new appliances and heating and cooling products. Read on to learn about simple and often inexpensive ways that your whole family can pitch in – and get ready to reap the savings!

# Natural Resources Canada's Office of Energy Efficiency

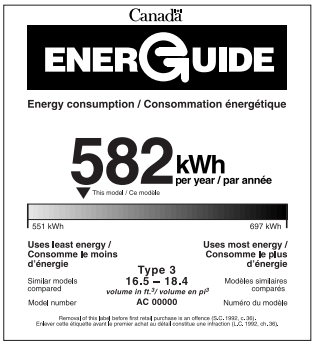
At Natural Resources Canada's Office of Energy Efficiency, we help Canadians find better ways to use energy and get the most from their energy dollars while protecting the environment. Learn more by visiting us on-line at **oee.nrcan.gc.ca**.

# Shop Smart

Look for references to EnerGuide and ENERGY STAR throughout this booklet. They will guide you to the best energy-saving products and help you calculate an appliance's annual electricity cost or vehicle fuel consumption costs.

EnerGuide is a Government of Canada system that rates the energy consumption and efficiency of household appliances, heating and ventilation equipment, air conditioners, houses and vehicles.

# EnerGuide for Appliances and Equipment




You'll find the EnerGuide label on all kinds of products, from refrigerators to cars. The EnerGuide label enables you to compare the energy performance of different products and make informed buying decisions. EnerGuide also helps you calculate how much electricity your new product will cost you each year.

Simply take the EnerGuide rating on the label and multiply it by the amount you pay for electricity per kilowatt hour (kWh).

Let's say your electricity rate is 7¢ per kWh, and the EnerGuide rating on the appliance you're going to buy is 400 kWh per year.

Based on the EnerGuide calculation, you can expect to pay about $28 per year in electricity for the appliance (400 x 0.07 = 28).

For more information on EnerGuide, visit the Web site at **oee.nrcan.gc.ca/energuide**.

## Energy Star


Energy Star is an international symbol that is applied to products that meet or exceed high levels of energy efficiency. Products that feature the Energy Star symbol are among the top energy performers on the market.

But there's more to Energy Star qualified products than saving money – they're also better for the environment. Energy-efficient products use less energy, which in turn creates less demand on the electrical generation system. This is where the worst of the pollutants and greenhouse gas emissions come from when using appliances.

# EnerGuide for Houses

Developed and quality-assured by the Government of Canada, EnerGuide for Houses is an evaluation service that determines the energy efficiency of homes. EnerGuide for Houses is delivered to homeowners across Canada, for a reasonable fee, by a network of independent experts in private sector companies, not-for-profit organizations, associations and government agencies.

The evaluation service helps homeowners plan where and how to build energy efficiency into their home's repair and renovation over time.

The evaluation service, which takes one to two hours to complete, involves a walk-through evaluation of aspects of the home that contribute to its energy use – the exterior surfaces (i.e., the building envelope); windows; insulation; hot water, heating and cooling and ventilation systems; and airtightness. Homeowners receive a written report and have an opportunity to discuss it with the evaluator. The report outlines problems, potential renovation issues and cost-effective remedies.

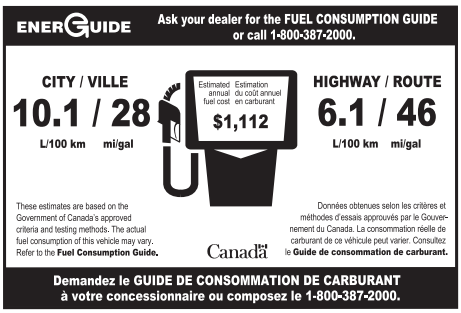
Each house also receives a label that shows the EnerGuide rating of the house's energy efficiency before upgrades. Homeowners are offered a free second evaluation and a new EnerGuide label after key upgrades are completed, which they can use to prove the value of their energy upgrades when they are reselling their home.

Typical EnerGuide for Houses ratings (bearing in mind regional variations in construction and age) are as follows:

- Old house not upgraded ..... 0 to 50
- Upgraded old house..... 51 to 65
- Energy-efficient upgraded old house or typical new house ..... 66 to 74
- Energy-efficient new house ..... 75 to 79
- Highly energy-efficient new house..... 80 to 90
- House requiring little or no purchased energy ..... 91 to 100

# EnerGuide for Vehicles

The EnerGuide for Vehicles label is affixed to all new vehicles sold in Canada. It provides consumers with information on the city and highway fuel consumption of new vehicles along with their estimated annual fuel costs. The estimated annual fuel cost shown on the label is based on 20 000 km travelled, based on 55 percent city and 45 percent highway driving and projected costs for gasoline and diesel fuel. Using this information and vehicle fuel consumption ratings, consumers can compare vehicles and find the one that is the most fuel efficient and has the lowest annual fuel consumption and fuel cost.



*Part 1*

# Heating, Ventilation and Air Conditioning

# Heating

**Your heating bill makes up as much as two thirds of your annual energy bill. That's why it pays not only to shop smart when choosing a heating system for your home, but also to keep your system clean and well maintained.**

**Today, most Canadian homes are heated by forced-air furnaces (oil, natural gas or electric) or by electric baseboard heaters.**

**Installing one of today's highly energy-efficient furnaces can save you up to 25 percent of your home heating costs and will pay you back for its higher initial cost in only a few years.**

## 1 Forced-Air Furnaces

Forced-air furnaces – whether fuelled by oil, natural gas or electricity – are similar for two reasons. They draw cooler air from your house through a system of cold-air return ducts. This cooler air is then reheated and, using fans and ductwork, forced throughout your house.

## 2 Building a new home?

Since so much of your energy costs come from heating your home, why not let the sun do some of the work? Here are two things you can do when planning where to build and when designing your house:

- Design your home so that the main living areas – and the largest windows – are located mostly on one side of the house.
- Place the home on your lot so that the side of the house with the most and largest windows faces south.

The sun's rays will easily enter your home throughout the year and help out with household heating. This is called passive solar design, which can save you up to 20 percent on your house's total energy requirements. However, if the windows are inefficient and badly placed, savings will be lost.

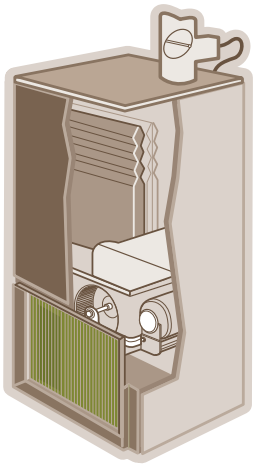
Passive solar design is a technique incorporated into the R-2000* Standard, which can be used for any home. This made-in-Canada standard uses tried and tested leading-edge building techniques to produce a healthy, comfortable and highly energy-efficient home that pays you back year after year in energy savings.

Before you decide what to build, speak to an R-2000 builder and ask what models are available. R-2000 builders are listed on the Web site at oee.nrcan.gc.ca/r-2000.

** R-2000 is an official mark of Natural Resources Canada.*

**Have your furnace serviced regularly. A properly maintained furnace works safely and at peak efficiency. Major care of your forced-air furnace should be left to a qualified service technician, but you can do many things yourself to help keep your furnace working well.**

3 Change or clean furnace filters every one to two months throughout the year. Dirty air filters block airflow and can damage the heat exchanger.



4 A furnace-filter alarm will let you know when the filter needs to be changed. These alarms make a whistling sound when they sense that filters are dirty.

5 If your furnace has a fan belt, inspect it for cracks or signs of wear (and replace it if necessary) when you change the filter. (Be sure to always shut off the electricity at the appliance switch and circuit-breaker panel before inspecting and changing filters and fan belts. Always read the furnace manual or contact a qualified technician.)

6 For your safety, make sure that furnace panels and grilles are kept in place and that fan compartment doors remain closed when your furnace is operating.

7 By adjusting the variable-diameter pulley on your furnace's fan motor, you can increase fan speed and airflow through your house.

8 Make sure that hoods and pipes on all fuel-burning equipment are securely attached and that outside vents and chimney liners are not blocked by leaves or birds' nests.

9 Keep the area around your furnace clear. Do not store items against the furnace, never store flammable items in the furnace room, and do not block or close any of the furnace's air openings.

## Oil Furnaces

10 Check for a dirty flame. You'll find a small flap covering a hole on the front of your furnace. Opening the flap enables you to see the burner's flame inside. If black smoke is coming from the tip of the flame, your burner probably needs adjustment.

11 Check for soot around the flap and chimney. As soot builds up, it reduces the efficiency of your furnace. Call a qualified service technician if you think that your furnace needs cleaning.

12 As part of your furnace's annual service visit, ask to have the chimney and furnace vent system checked. Pipes must be properly connected, and there should be no signs of rust or other damage. Ask the service technician to check that nothing has fallen into the base of the chimney or into the flue.

## Natural Gas Furnaces

13 If your furnace is equipped with a continuous pilot light, you can save money by turning off the pilot light during the summer months. Although your furnace's manual may contain detailed instructions, we recommend that your heating contractor relight the unit as part of your fall furnace maintenance visit.

14 Never insulate or seal draft hoods, wind caps and exhaust vents on natural gas appliances.

15 As part of your furnace's annual service visit, ask to have the chimney and furnace vent system checked. Pipes must be properly connected, and there should be no signs of rust or damage. Ask the service technician to make sure that nothing has fallen into the base of the chimney or into the flue.

## 16 Cut Your Costs!

If you're in the market for a new furnace, think about getting an EnerGuide for Houses evaluation for your home first. By air sealing and insulating your home before you install a new furnace, your heating requirements could be considerably reduced. You may even be able to purchase a smaller model (see "Is Bigger Better?" on this page). You can ask your EnerGuide for Houses advisor to provide you with a heat load calculation to help you buy a correctly sized furnace. You can find an advisor in your area on the EnerGuide for Houses Web site at oee.nrcan.gc.ca/houses.

## 17 Looking to Buy?

Compare furnaces when you shop. Check the back of manufacturers' brochures for EnerGuide ratings. You'll also see a rating for AFUE, or Annualized Fuel Utilization Efficiency. The AFUE number is a measure of the furnace's efficiency – i.e., how much fuel it has to burn in a year to keep a house comfortable. The higher the AFUE number, the more efficient the furnace. Furnaces that have AFUE numbers over 90 meet ENERGY STAR performance levels. These furnaces may cost more to buy, but they will save as much as 40 percent of your home heating costs each year. In most cases, it will take only a few years to recover the extra cost of a better furnace.

## 18 Is Bigger Better?

When it comes to furnaces, bigger is not always better. If your furnace is too large, the unit will stop and start often, which burns more fuel – and costs you more money. That's why it's important to buy and install the furnace that is right for your house. Some furnace installers will perform heat-loss/heat-gain calculations to find the furnace that matches the size of your home. Independent EnerGuide for Houses advisors can also offer this service. Other installers base their recommendations simply on the size of your house; however, these calculations are not always accurate because not all homes of the same size have the same heating needs.

# Electric Heaters

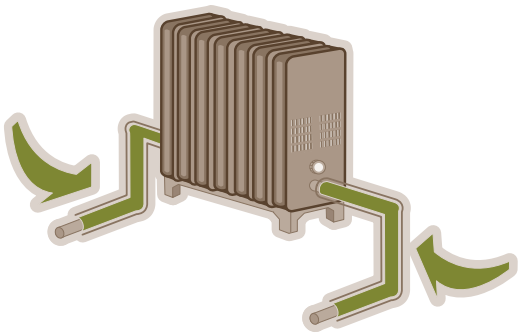
19 Install electric baseboard heaters at floor level along outside walls. Whenever possible, make sure that baseboard heaters are either under windows or near windows or doors.

20 To avoid fire hazards, keep baseboard and space heaters away from furniture, rugs and drapes.

21 Use portable electric space heaters in hard-to-heat areas such as home offices, garages and enclosed porches. These heaters provide warmth only when and where it's needed.

# Hot Water Heating

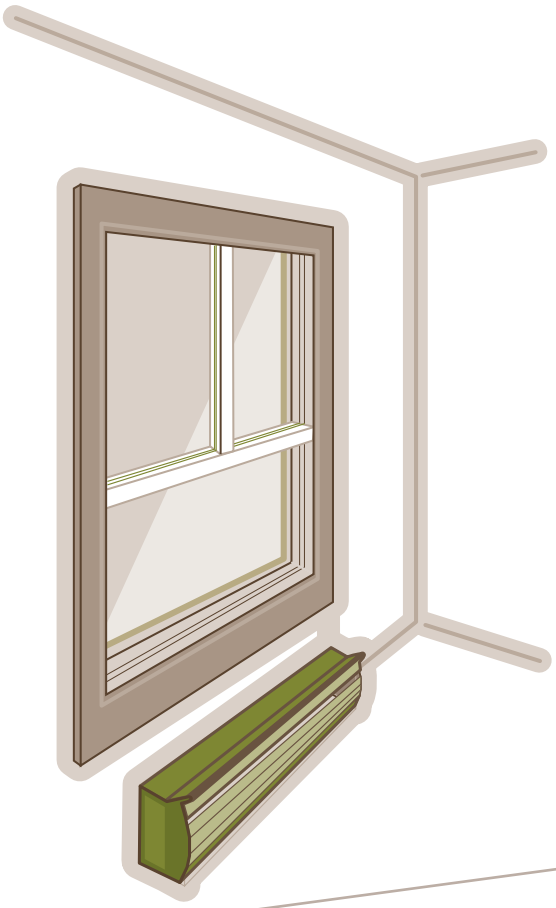
22 To save energy, make sure that water pipes going to and from radiators are well insulated in areas of the house where extra heat is not required.



23 Air must flow freely around and through radiators to properly heat rooms in your home. Place all furniture, rugs and drapes away from radiators, and never stack items on top of these heat sources.

24 Maintain your radiators' efficiency by vacuuming or brushing regularly to allow maximum air movement through the fins or castings. Fins are the thin aluminum plates in some baseboard systems. They can be easily straightened by hand.

25 Place sheets of aluminum foil or foil-coated bubble wrap behind your radiators to reflect additional heat away from walls and into your rooms.



## 26 "Bleeding" Hot Water Radiators

During the summer, air can become trapped in hot water heating systems, blocking the flow of water and increasing your energy costs. To remove this trapped air, radiators must be "bled" once the boiler comes on in the fall. First, check the water-level gauge on your boiler to make sure that there is enough water in the system. Then simply open each radiator screw – one at a time – until only hot water flows from the vent. Close the screw and check for leaks. Be careful: water in these systems is extremely hot and can cause severe burns.

## 27 Warm Floors = Warm Feet

Building a new home or an addition? Turn your floors into radiators by installing radiant hydronic heating. This type of heating system uses hot water pipes installed in the floors. Heat then rises through the flooring to heat your house – and keep your feet warm. With radiant floor heating, you can set the thermostat several degrees lower. This is because the entire surface of the floor radiates about the same amount of heat that the human body does, making the occupant feel warm even though the air temperature might be only 18°C (65°F).

# Air-to-Air Heat Pumps

28 To get the most savings from your heat pump, leave your thermostat set to a temperature that's comfortable year-round – 20°C (68°F) is recommended. Raising the temperature may trigger the system's electric backup heater, which will reduce your energy savings.

29 Protect outdoor parts of your heat pump from high winds, which may cause defrosting problems and reduce system efficiency. Your heating pump manual or a qualified technician can help you do this properly.

30 Place outdoor heat pump parts away from the drip-line of your house. This will prevent ice and water damage to fans and motors.

31 Check, clean and replace heat pump filters and coils monthly or according to manufacturers' instructions. Clean fans and lubricate fan motors annually. Dirty filters, coils and fans reduce airflow, use more energy and can cause compressor damage.

32 Inspect and vacuum the interior of accessible ductwork regularly. Loose insulation and dust buildup, for example, may block airflow. Ensure that all dampers are returned to their original position after vacuuming.

33 Be sure that vents and registers are not blocked by furniture, carpets or other items that can reduce airflow.

## 34 Looking to Buy?

Check the EnerGuide ratings on new heat pumps; units with the highest ratings are the most efficient. You can find the rating at the back of the manufacturer's brochure.

Select an outdoor unit that has a demand-defrost control. This will allow you to cut down on the number of defrost cycles, which use more energy and can shorten the life span of your heat pump.

Not sure what size your heat pump should be? Consult *Determining the Required Capacity of Residential Space Heating and Cooling Appliances* (CSA-F280-M90). This handy booklet from CSA International will help you choose a unit that's just right for your home. See the address and phone number in "Information Resources."

# Fireplaces

**More than 3 million Canadian households burn wood as a source of heat and enjoyment. If used properly, wood energy is economical, renewable and effective.**

**Consider buying an energy-efficient woodstove, fireplace or insert that is airtight. Not only are they cleaner and safer, they'll also save you money. They use up to 50 percent less wood than conventional wood-burning appliances, which could mean savings of hundreds of dollars each year.**

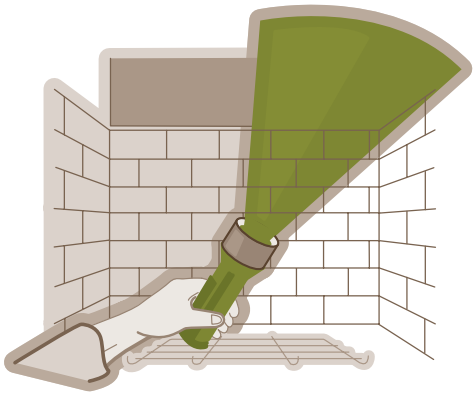
**A wood fire can be cosy, but breathing in the smoke isn't healthy. The best fire is a hot one that creates almost no visible smoke outdoors and no smell of smoke indoors. And don't forget: where there's smoke, there's pollution. Here are some tips on how to make your fire burn cleanly.**

### Wood Stoves and Wood-Burning Fireplaces

35 Make sure that your stove, fireplace or insert is the right size for your house and that it is installed by a qualified professional in a location where the appliance can effectively heat the space.

36 Check for air leaks where chimneys and walls meet (you may need to remove the trim). Caulk these joints with flexible, heat-resistant material.

37 Winterize your fireplace. Patch cracks and gaps in brickwork. Examine your damper by shining a flashlight up the flue. Repair the damper seals if they're worn. Close the damper when your fireplace is not in use.



38 Install glass doors on your wood-burning fireplace. When the fireplace is not in use and these doors are closed, they stop warm air from escaping your home and block cold air from being drawn down the chimney.

39 Whenever possible, keep the glass doors open while the fire burns. This allows some radiant heat to enter the room from the unit's hot masonry. Be sure to keep the spark screen in place.

40 Season your firewood properly. Cut, split and stack wood where it will be sheltered from the weather. Cover and store wood outside (keep only a small amount of wood in your house). Allow wood to dry fully – for at least six months – before burning. Cracks in the ends of wood indicate that it is properly seasoned.

41 Split wood into pieces that are 10 to 15 cm (4 to 6 in.) in diameter. The wood will burn more cleanly with more surface area exposed to the flame.

42 Make sure that your fire is getting enough fresh air to burn "hot and clean," which results in more complete combustion and less smoke. Check that the air inlet is open wide enough to keep the fire burning briskly.

43 Don't stuff too much wood inside the firebox at once; instead, refuel more often with smaller loads.

44 Don't use your fireplace at all when the outside temperature is below –7ºC (20ºF). The infiltration of cold air into your home through the open flue more than offsets any heat gained.

### Gas Fireplaces

45 If your gas fireplace will be located against an exterior wall, make sure that a professional installs an insulated outer casing first to help reduce heat loss to the outside of your home. These casings can be used only with inserts and not with free-standing units.

46 Keep the glass doors on your gas fireplace clean – dirty doors block heat from escaping the fireplace. Consult your owner's manual to learn which cleaner to use for the type of glass installed in your fireplace doors.

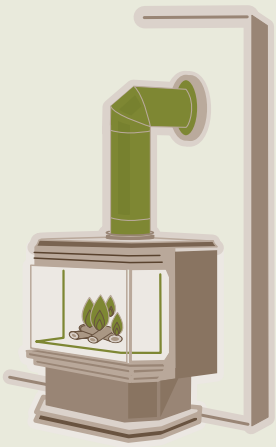
47 If possible, choose a ceramic glass front, which resists shattering better and gives off heat more efficiently.

48 Shut off your gas fireplace pilot light during summer months. If you're uncomfortable with relighting the pilot, ask your heating contractor to show you how during the next servicing.

49 For added comfort, install a fireplace thermostat to help you control room temperature.

## Looking to Buy?

50 ✓ When choosing a gas fireplace, make sure that the unit you purchase can be vented to the outdoors. This is especially important because units that are not vented to the outdoors can pose serious health hazards by emitting increased levels of nitrogen oxides, carbon dioxide, carbon monoxide and large amounts of water vapour.



✓ It is important to know that some gas fireplaces are more energy efficient than others. The most accurate measurement of energy efficiency for vented gas fireplaces is based on CSA International's P.4 rating.

✓ CSA International P.4 is the performance-testing method that is used to measure annual gas fireplace efficiency. A good energy-efficient model should have a P.4 rating of between 50 and 70 percent or even higher.

## 51

### Always burn:

- ✓ Clean, dry wood
- ✓ Properly seasoned, split wood
- ✓ A mix of hardwood and softwood, where possible, depending on what is available in your region

### Never burn:

- ✓ Wet or green wood
- ✓ Household garbage such as plastic or cardboard
- ✓ Painted or stained wood
- ✓ Pressure-treated wood
- ✓ Particleboard or plywood
- ✓ Driftwood
- ✓ Glossy magazines
- ✓ Any materials prohibited by local by-laws

These items may release toxic chemicals into the air and damage your stove or fireplace – and your health!

- ✓ Choose a fireplace that has an automatic starter or electronic intermittent ignition. An alternative is to choose a unit in which the pilot light can be shut down when not in use.
- ✓ Look for direct-vent fireplaces with features such as two-stage pilot lights, which run a very low flame when the fireplace is turned off, and intermittent electronic ignition systems, which enable you to easily turn off and relight pilot lights.

## 52

### Keep it Clean

To reduce the chance of chimney fires, clean the flue regularly. Simply remove the flue cap and clean the interior of the pipe with a chimney brush, available at most hardware stores. The stiff bristles remove creosote buildup and loosen soot, which falls into your woodstove.

## 53

### Stove Sizing: Bigger Isn't Better!

Before buying a stove or fireplace insert, carefully consider the size you need. Remember: a clean burn comes from a hot fire. An oversized unit will create too much heat for your space. As a result, you'll have to burn wood more slowly and at lower temperatures. This increases the amount of smoke and the buildup of dangerous residues in your chimney.

# Air Conditioning

**On the hottest summer days in Canada, a lot of electricity is used to power home air conditioners. Luckily, you can keep your house cool in many other ways that use less electricity, save money and help protect the environment. When it's time to turn on your air conditioning, remember that everything else you do to keep your house cool will help – the less heat there is in your house, the less energy your air-conditioning system uses to cool the space.**

## Room Air Conditioners

54 Install an automatic setback thermostat that turns off your air conditioner at night.

55 Opening windows costs nothing but saves a lot of energy. Keep your windows open in the evening and overnight to allow cooler air into your home, and don't forget to turn off your air conditioner. Close the windows during the day to keep the cool in and the heat out.

56 Use fans as your first line of defence against summer heat. Ceiling fans, for instance, cost about 5¢ an hour to operate – much less than air conditioners.

57 You can reduce air-conditioning energy use by as much as 40 percent by shading your home's windows and walls. Plant trees and shrubs to keep the day's hottest sun off your house.

58 Keep blinds and curtains closed during the day to keep your home cool.

59 Bigger is not necessarily better. Oversized room air conditioners use more energy and often cool and dehumidify poorly. Measure your room and the window in which you'll mount the unit to make sure you buy only what you need. Put the money you save on a smaller air conditioner toward a better model – perhaps one with a programmable thermostat or timer.

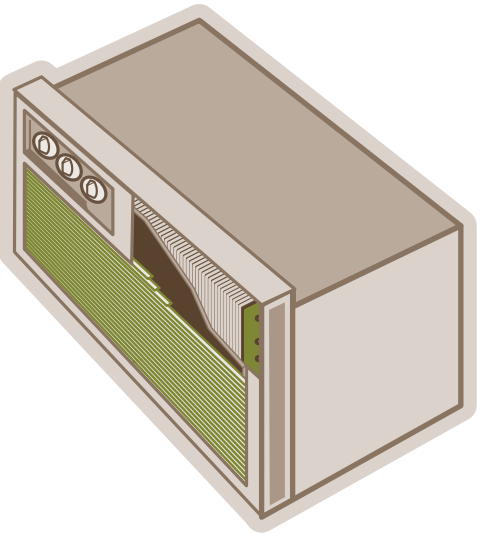
60 You'll use 3 to 5 percent more energy for each degree your air conditioner is set below 24°C (75°F), so set the thermostat of your room air conditioner at 25°C (77°F) to provide the most comfort at the least cost.

61 A good air conditioner will cool and dehumidify a room in about 30 minutes, so use a timer and leave the unit off during the day.

62 Poorly mounted and sealed room air-conditioning units allow cool air to escape outside, which means that the air conditioner must work harder and use more energy. Make sure that your unit is properly installed. Seal any gaps around the air conditioner with foam insulation strips or removable caulking.

63 Keep doors to air-conditioned rooms closed as often as possible.

64 Clean the air-conditioner filter every month. A dirty air filter reduces airflow and may damage the unit. Clean filters enable the unit to cool down quickly and use less energy.



65 Remove window air conditioners for the winter. If they must stay in place, seal them with caulking or tape and cover them with an airtight, insulated jacket.

66 If your room air conditioner is older and needs repair, it's likely to be very inefficient. You're better off buying a new energy-efficient room model.

67 The cost of new, energy-efficient room air conditioners may seem high, but they may actually save you money within a few months, especially if you've been using an older unit that's always on and barely able to cool your space.

## Central Air Conditioners

### Buying

68 As with room air conditioners, bigger central air-conditioning units aren't necessarily better. Oversized air-conditioning systems use a lot more energy but often don't cool your home any better than a properly sized system. Measure the square footage of your house carefully to get the system that's right for you. And be sure to have your system installed by knowledgeable and qualified technicians.

### Maintenance

69 Service your central air-conditioning system at least once a year. Coolant leaks are a particular problem, as they release greenhouse gas emissions into the atmosphere and cause your air-conditioning system to use more energy.

70 Close air vents in unused rooms.

71 Turn off all sources of heat whenever you can, including lights and appliances, especially at the hottest times of the day. Do your baking, washing, drying and ironing early in the morning or in the evening.

# Ventilation

## Ductwork

73 Keep furniture, rugs and drapes away from all return-air grilles and hot air registers to allow free movement of air.

74 Install plastic deflectors on hot air floor vents to direct heat away from cooler outside walls and into main living areas.

75 Prevent air leaks by covering ductwork joints with mastic or aluminum-foil duct-sealing material. Don't use fabric duct tape, which will dry out and crack over time. For major work, get a professional to help you insulate and repair all ducts.

76 You can also seal joints on exposed ductwork with fibreglass or mineral-wool insulation. Never insulate heating ducts with foam plastic, which may melt or cause fire.

77 If your basement has been converted to a living area, install supply and return registers in the basement rooms.

72

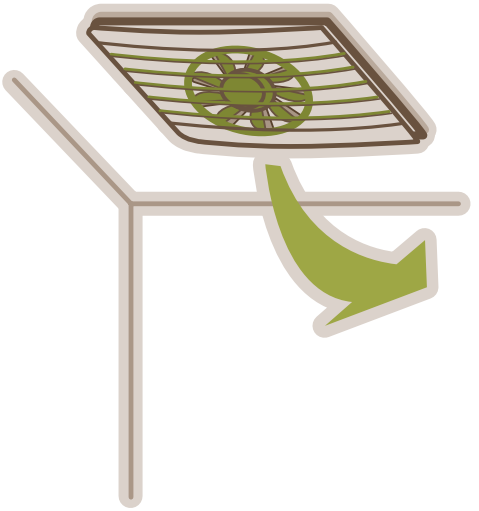
### Looking to Buy?

✓ ENERGY STAR qualified room air conditioners contain compressors that are more efficient, usually operate more quietly and often have energy-saving timers.

✓ ENERGY STAR qualified central air conditioners use 20 percent less electricity than conventional units.

## Exhaust Fans

78 Be sure to keep your kitchen and bathroom exhaust fans clean. Regularly wash or replace any filters.



79 Ensure that all bathroom, kitchen and other exhaust fans in the house are vented all the way to the outside, not into the attic or crawl spaces. Make sure that the places where the exhaust columns exit through the roof or side walls are properly caulked to prevent air leakage into the wall and ceiling cavity. Baths and showers create a lot of warm, moist air. Trapped in the attic, this air can cause moisture buildup, which will damage the attic's woodwork and insulation.

80 Install a timer switch on your bathroom fan so that it runs only as long as you need.

## Ceiling Fans

81 Ceiling fans use less electricity than air conditioners or furnaces. The trick is to get all these units working together to keep your house warm in the winter and cool in the summer.

82 Most ceiling fans can be switched to change the direction of the airflow. In the winter, let the fan push warm air toward the floor where it will cool and be drawn back to the furnace to be reheated. In the summer, the fan can draw air upward, cooling the room and ensuring a constant airflow. This is especially good for houses that have electric baseboard heaters.

83 High cathedral ceilings can be beautiful, but they tend to collect heat because hot air usually rises. Install a ceiling fan and push that valuable warm air to the floor.

84 Look for Energy Star qualified ceiling fans. If they have lights, use compact fluorescent lights to further reduce electricity use and heat buildup.

## Vents and Air Intakes

85 Vents and air intakes are the points inside and outside the house where stale air is vented outdoors and outdoor air is drawn in.

86 Always check that vents are kept clear of snow, leaves and other garden debris to keep your fans and ventilation systems running safely and efficiently.

87 Avoid storing garbage or idling your car (which is very energy inefficient anyway!) beside or near your home's air ventilation intake.

## Whole House Ventilation Systems

**It's important to properly ventilate your home in order to keep air fresh and reduce moisture. If condensation builds up on your windows, for instance, chances are that your ventilation system needs an upgrade. A heat recovery ventilation system not only helps improve energy efficiency but can also make for a healthier and more comfortable indoor environment. A heating and ventilation contractor can help you decide what's best for your home.**

# 88 HRV

- ✓ If your home has a whole house ventilation system, such as a heat recovery ventilator (HRV) or energy recovery ventilator (ERV), it pays to keep it running efficiently with regular servicing.
- ✓ Operating your HRV continuously even in the non-heating season will keep your home cooler, quieter and cleaner. By removing some of the heat from incoming air, most HRVs will reduce the load on the air conditioner and save you money.
- ✓ Filters should be cleaned or replaced every one to three months. Washable filters should be vacuumed and then washed with mild soap and water. Most washable filters will last several years before they need to be replaced.

*Part 2*

# Housing

# Thermostats

89 Thermostats are wall-mounted, temperature-sensitive devices that control heating and cooling equipment.

90 Make sure that your thermostat is located on a central interior wall in a main living area and away from heat sources such as stoves and fireplaces, appliances, bright lights, sunlight, heating vents and radiators. Thermostats should never be installed near windows or doors or in halls where drafts may affect their ability to properly sense and control the temperature in your home.

91 If your house's temperature is 16°C (60°F) and you want to raise it to 20°C (68°F), turning the thermostat to 25°C (77°F) will not heat your house any faster – but it will use more energy.

92 To work properly, your thermostat must be kept clean and perfectly level; have it checked seasonally when your furnace is serviced.

93 In the winter, wear warm, loose clothing to save energy and money. By wearing a sweater, for instance, you could lower the thermostat by 2°C (4°F) and save as much as 4 percent on your fuel bill.

## 95 Programmable Thermostats

Programmable thermostats can be set to automatically adjust the temperature in your home day and night. During the workweek, for example, a programmable thermostat could be set to lower your home's temperature while you're out and raise it again just before you come home. Remember not to lower the temperature too much: your energy savings will be lost because the furnace will have to work harder to raise the temperature back up. If you go out on an evening when you'd normally be home, simply over-ride the thermostat's automatic setting and lower the temperature manually.

## 94 Recommended Thermostat Settings

To save energy and money in the winter, set your thermostat to the lowest temperature that's comfortable for you. Remember: for every 1°C (2°F) you lower the thermostat, you save 2 percent on your heating bill.

| Activity | Recommended Thermostat Setting |
|---|---|
| Sitting, reading or watching TV | 21°C (70°F) |
| Working around the house | 20°C (68°F) |
| Sleeping | 18°C (64°F) |
| Out for the day or on vacation | 16°C (60°F) |

96

## In the Zone

"Zone heating" divides your home into a number of areas, each with its own thermostat. By controlling temperatures throughout your house, you're better able to control your heating bill. But remember: doors that separate zones must be kept closed.

97

## Energy Star

If you're installing a new thermostat in your home, look for programmable thermostats that meet Energy Star performance levels. These thermostats feature at least two programs with four temperature settings each. Used properly, these thermostats can save you up to 30 percent on heating and cooling bills.

101

## Keep it Clean!

Because of the amount of air and moisture that flows through your dehumidifier, bacteria can build up quickly. Make sure that you regularly clean your unit, especially its filter and the bucket where the water accumulates. Brush the coils with a mixture of water and bleach, and rinse the filter under hot soapy water.

# Humidity Control

**Four people in a house produce about 10 kg of moisture per day from cooking, washing, respiration and perspiration.**

**Moist indoor air is a common reason that windows frost over in winter, which can lead to mould buildup and damage to walls from dripping water. This is bad for your house, causing deterioration in the structure, and it's bad for your family's health. It's important to maintain healthy indoor ventilation levels, ideally using an energy-efficient heat recovery ventilator (HRV) at all times – especially in winter.**

**Is your home humid? Install a dehumidistat, which turns the furnace fan or ventilation system on and off to help control moisture in the air.**

**Humid air feels cooler in winter and hotter in summer, so correct humidity levels will improve your family's comfort.**

**Moisture levels are always much higher in newly built houses. A newly built house should be over-ventilated for the first year to allow it to "dry out."**

## Dehumidifiers

98 Dehumidifiers remove moisture from the air. They're especially handy in basements, which are often uncomfortable due to dampness. The dampness could be due to poor ventilation or to basements that need to be better insulated.

99 You can buy dehumidifiers that can be used to treat individual rooms or, if you've got a forced-air heating and cooling system, to remove moisture from your entire house. If your house is new and well insulated, an air-to-air heat exchanger might work better than a dehumidifier to improve ventilation.

100 Whatever you choose, make sure that the system is the right size for the space you need to dehumidify. Dehumidifiers use a lot of energy to take moisture out of the air. Energy use is based on the number of watts the unit uses to take a litre of moisture out of the air. To find the unit that does this most efficiently, look for the ones that meet Energy Star guidelines. Better still, visit Canada's Energy Star Web site at oee.nrcan.gc.ca/energystar to choose the best model and size for your needs.

## INSULATION

102 Thanks to your home's heating and air-conditioning system, temperatures inside your house throughout the year are often very different from those outside. A good insulating system will keep it that way, blocking heat from getting out in the winter and getting in during the summer.

103 Is your house well insulated? To find out, check your roof during the winter. If snow regularly melts – even on cloudy days – chances are that your attic is poorly insulated and heat is escaping. Check around the foundation as well. If snow has disappeared from the sides of the house, it's probably because heat escapes from your basement walls.

104 Installing or adding insulation is neither difficult nor particularly expensive. However, there are safety issues in proper installation. It is always recommended that you get professional advice before insulating an attic or roof space. Insulating materials are rated by R-value, which measures a material's ability to block heat. The higher the rating, the less heat can pass through the insulation.

105 Check the insulation throughout your home – in the attic, ceilings, exterior and basement walls, floors and crawl spaces.

106 Where possible, when renovating, add insulation to the levels and in the manner indicated in your local building codes. You can get this information from your local municipal office.

107 An EnerGuide for Houses recommendation, which typically improves on local code minimums, will offer even better guidance.

108

## EnerGuide for Houses

An EnerGuide for Houses advisor will assess the state of your home's insulation and recommend upgrades during the visit. He or she will also recommend where more complex insulation jobs that require the services of a qualified contractor are worth the investment. Your EnerGuide for Houses advisor will also recommend the best types of insulation to use in each application.

On average, a homeowner who has an EnerGuide for Houses energy assessment performed and implements the recommended improvements saves 20 percent on heating bills (and up to 1.4 tonnes of greenhouse gas emissions per year)!

You can learn more about the EnerGuide for Houses service by visiting the Web site at oee.nrcan.gc.ca/houses.

109

## Cold Feet?

Are your floors cold? Don't turn up the heat – throw down a rug. Rugs not only help to insulate your floors, especially above unheated spaces such as garages and crawl spaces, but also insulate against noise, helping to make your house quieter.

# 110

## Go Green!

Want to save energy and help the environment? Then spend a little time on your own environment. Plant evergreen trees and thick hedges to block winter winds from blowing against your home. For most Canadian homes, the best place to plant is on the northwest side.

Plant deciduous trees near your house on the east and west sides of your property. They will help block the summer sun. After their leaves have fallen in the autumn, the sun will shine through to help warm your home in the winter.

### Attics

111 Proper attic ventilation serves two important purposes in your home: relieving heat buildup and removing unwanted moisture. During the summer months, proper attic ventilation expels hot, stale air, making it easier to cool your home.

112 Moisture can cause serious damage to wood framing and has a big impact on the effectiveness of your attic insulation. That's why it's important to make sure that all exhaust fans in the house – in the bathroom and kitchen, for instance – are vented all the way to the outside, not into the attic or crawl spaces.

### Basements

113 Your basement's concrete floors will be much more comfortable if they're covered with area rugs or carpets. Rugs help insulate and save energy.

114 Install carpets on concrete basement floors only when you're sure that the floor is fully waterproofed. Mould and insect infestation problems can occur if the carpet becomes damp.

115 Install doors that are fully insulated, not hollow, on all entrances to cold storage rooms and uninsulated basements and garages.

### Attached Garages

116 Building a new home? If possible, design it so that the garage is on the north side to help shield your house against winter wind.

117 If you have a room over your garage, make sure that the garage ceiling is properly insulated.

118 Any doors leading from the garage into the house should be fully insulated and weatherstripped.

119 Make sure that your garage door fits tightly to the outside frame and to the ground. To check the seal, turn on the garage's inside light, then close the door at night and inspect it from the outside. If you can see light around the edges, you've got leaks.

120 Keep the garage door tightly closed as much as possible to retain warmer air against the garage-side wall of the house. It will act as a buffer against the colder outdoor air beyond.

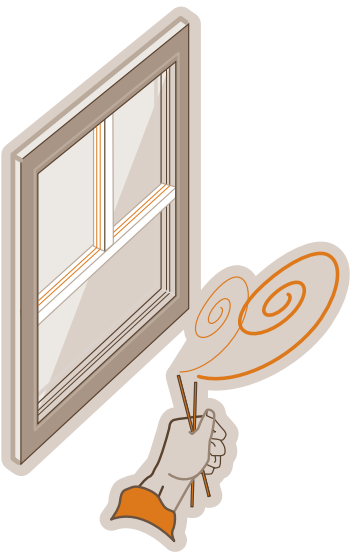
121 Keep the door between the garage and the house closed and properly weatherstripped to prevent exhaust fumes entering the home from vehicles that are exhausting inside the garage. If you have an attached garage, install a carbon monoxide detector inside the main living space of your house.

# Caulking and Weatherstripping

122 When cold air leaks into your house, some rooms – particularly those that face the wind – become drafty, uncomfortable and difficult to heat. These drafts or air leaks account for between 25 and 40 percent of heat loss in older homes. That means hundreds of dollars a year on the average heating bill for wasted energy.

123 What is the difference between caulking and weatherstripping? Caulking is used to seal gaps and leaks in fixed joints such as around window frames where they meet the wall of the house or where electrical wires or exterior taps go through exterior walls. Weatherstripping is used where a joint is moving or flexible, such as where a moving window sash meets the sill.

124 There is an easy way to detect air leaks: make your own draft detector using incense sticks, which create a white smoke when lit. Hold two or three together to create more smoke and make it easier to detect leaks. On a windy day, hold your draft detector near window and door frames, electrical outlets, baseboards and other potential leak locations. Strong drafts will blow the smoke away from the leak and cause the tips of the incense sticks to glow. Small drafts will gently blow the smoke or draw it toward the location of the leak. All leaks should be sealed.



125 A blower door test, which is part of the EnerGuide for Houses evaluation service, is the most thorough and complete way to identify all of your home's air leaks. Visit the Web site at oee.nrcan.gc.ca/houses-maisons/english/e31.cfm to read about a blower door test.

126 The outside doors of your house must fit snugly to prevent drafts and heat loss. Use weatherstripping around all exterior door frames. Felt and foam weatherstripping are inexpensive, but rubber is more effective and durable.

127 Caulking comes in many types and consistencies from a flexible gel to a spray foam. Check the labels to make sure that you've got the right material for your job. NRCan's fact sheets *Air Leakage Control* and *Improving Window Energy Efficiency* explain this in more detail.

128 Make sure that all surfaces to be caulked are clean and dry.

129 Caulking is applied best in warm weather, when the material is flexible and can fully penetrate holes and cracks.

130 Seal all cracks, holes and gaps outside and inside your house. This includes around windows; wire and pipe entrances through exterior walls; around bathroom, dryer and kitchen vents; baseboards; interior and exterior light fixtures; electrical outlets; and plumbing holes in interior walls. Pay special attention to areas under sinks and behind bathtubs, plumbing and wiring penetrations into the attic and attic hatches.

131 Common leakage areas that are often missed are the joints between the basement foundation and the main floor, called the rim joist.

132 Spider webs are a good indicator that there is air leakage. Spiders build their webs in the path of airflow to catch insects.

133 Wherever possible, caulk exterior cracks and holes from the outside as well as the inside to ensure that the wall structure is protected from wind, rain, snow, insects and dust.

134 Exterior caulking is made from materials that are different from interior caulking, and sometimes the fumes are unpleasant or even dangerous. Do not use exterior caulking for work inside a home.

135 Some caulking can be painted and some cannot. As well, some are mould-resistant for use in damp or wet areas. When buying caulk, be sure to tell the salesperson how you intend to use the product.

136 When sealing around ventilation and combustion air ducts, be careful not to block air circulation by overfilling with caulking. Never insulate or seal draft hoods, wind caps and exhaust vents on natural gas appliances.

137 Be sure to use compounds around chimneys and exhaust fans that have been approved for the specific use you are intending.

138 Some types of recessed lighting fixtures can present a fire hazard if sealed. If you are not certain what kind you have, ask a professional. Unsealed fixtures can be replaced with airtight ceiling or wall-mounted fixtures.

139 Seal ductwork joints with a water-based duct mastic sealant or approved foil duct tape. Do not use the commonly available fabric-based duct tape.

140 You can reduce heat lost through your electrical outlets, light switches and lighting-fixture receptacles by installing foam gaskets behind these outlets and switches. Switch off the electric power before doing any of this work.

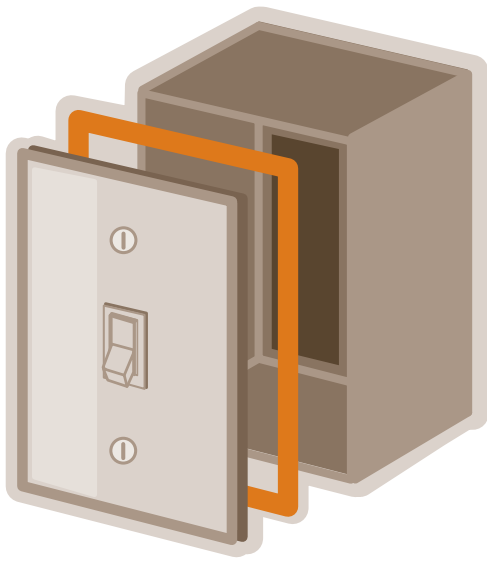
141 Consider replacing leaky outlets with airtight electrical outlets, available from any good hardware store.

142 Seal unused electrical wall outlets with plastic security caps to reduce heat loss.

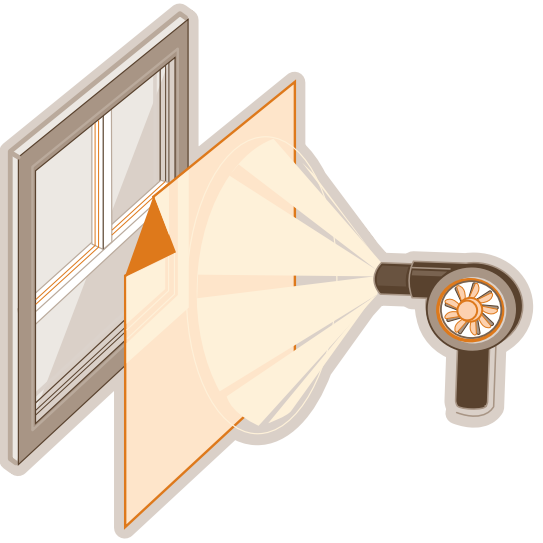
## Windows

**Long winters and hot, humid summers mean that a lot of heat moves through windows in many Canadian homes. In recent years, the quality of new windows has improved dramatically thanks to advances in technology and design. Modern windows are more energy efficient and help to reduce your heating and cooling bills. These windows also reduce condensation buildup and improve the quality and quantity of light that enters your house.**

143 In the winter, leave your curtains open to allow the sun's rays to heat rooms during the day. It is also important to allow warm air to move around the windows inside the house. This will stop moisture from building up and freezing on your windows. At night, close your curtains to help reduce the amount of heat that escapes through the windows. Close your drapes on summer days to help keep the inside of your home cool.



144 Heat-shrink film kits can help cut the amount of energy lost through your windows. These kits include sheets of clear plastic that stretch across the inside of your window frames and double-sided tape that holds them in place. When heated with a hair dryer, the plastic shrinks and makes an airtight seal around windows.

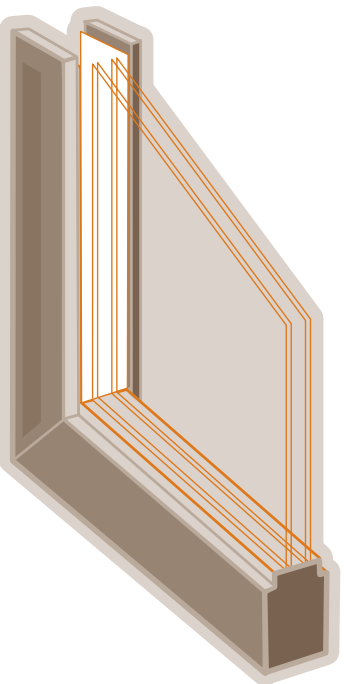


145 Clear plastic film with spline-and-channel kits include a sheet of heavy-duty plastic film, a plastic channel that attaches semi-permanently to the window surround and a plastic spline that pushes into the channel to hold the film in place. These are a removable and reusable version of heat-shrink film kits that should last for several years.

146 Make sure that your home is not losing heat around the outside of your windows where they join the exterior wall. Caulk the edges of the frames, but be careful not to plug drain holes on the bottom sills or in bottom tracks of sliding doors.

147 It's worth considering using a new kind of clear removable caulking on operable windows for the winter months. It simply peels off without harming paintwork when you want to open the windows again in spring.

148 Check weatherstripping on the movable parts of your windows and replace any that has become damaged or worn.



149 Heat is lost through even the smallest cracks in a window, so be sure to repair all broken windowpanes.

150 Replace double- or triple-pane windows that have become foggy between panes. These windows have lost their capacity to insulate.

151 Check your window locks to make sure they are secure and keep warmth in.

152 If you have single-pane windows, add storm windows to cut heat loss by as much as 50 percent. Better still, replace single-pane windows with energy-efficient double-paned windows with inert argon gas fill, warm-edge spacers and a low-emissivity (low-E) coating.

153 If you have central air conditioning and keep some windows closed year-round, leave storm windows on these as well. The air space between the two windows provides extra insulation and helps keep the house at the temperature you want.

154 If you are installing new energy-efficient windows in a renovation, be sure to ask that they be "sprayed in foam" for extra energy efficiency.

155 An industry-led program called WindowWise provides guaranteed, quality-assured, highly energy-efficient window installations. For more information on this program and local WindowWise contacts, visit the Web site at www.sawdac.com.

## 156 Looking to Buy?

If you're shopping for new windows, you'll find that many are gas-filled for added energy efficiency. Argon and krypton are two of the most common and effective gases. What's most important is the size of the airspace between the panes of glass in these windows.

- ✓ Argon-filled windows need about 13 mm ($\frac{1}{2}$ in.) between window panes. The panes in krypton-filled windows must be about 10 mm ($\frac{3}{8}$ in.) apart.
- ✓ Regardless of gas or design, energy savings stop at 20 mm ($\frac{3}{4}$ in.). When window panes are separated by more than this amount, their insulation value starts to drop.
- ✓ Also look for warm-edge spacers as a part of the manufactured window. These low-conductivity components are another valuable factor in an energy-efficient window.

## 157 Choose Low-E!

Your windows can do more than let heat into your home – they can also keep the heat from escaping. Low-emissivity (low-E) windows have a special coating that saves energy. This coating helps cut heat loss by reflecting warmth back into your home. The insulation of the space around the windows should also be appropriate.

## Doors

158 Can you feel air blowing in along the edges of your exterior doors? Try attaching brush or PVC weatherstripping. It's easy to install and will help cut energy losses.

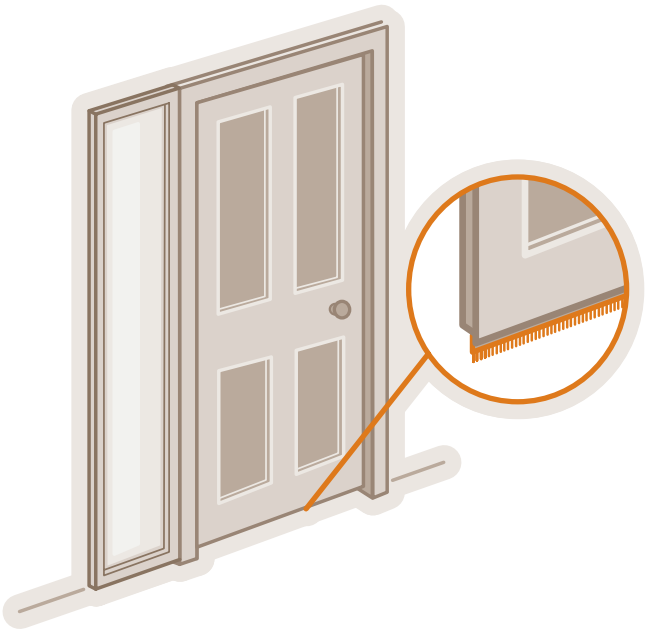
159 Does your home have a sliding glass door? Make sure to keep its track clean. A dirty track can ruin the door's seal and create gaps through which heat will pass.

160 If you don't use your patio door in the winter, cover the inside with heat-shrink plastic (see tips 144 and 145). Removable sealants are also available. These materials are applied like caulking but can be easily stripped off in the spring.

161 A lot of heat is lost through mail slots in doors. Spring-loaded flaps and nylon seals will help keep these slots closed tightly.

162 Heat can also be lost through keyholes in older doors. Keyholes can be sealed with covers.

163 Plastic and rubber weatherstripping should bend easily and spring back to shape. Replace weatherstripping whenever it shows signs of wear.



## 164 Cold Clue

Your home's exterior doors should be insulated, not hollow. To check if a door provides good insulation, place your hand against it from the inside. If it feels cooler than the inside walls, it might be time to install a door that's better insulated.

## 165 Put a Sock in It!

A door sock is a long, snake-like tube of material stuffed with sand or birdseed. It fits snugly against the bottom of an exterior door to stop drafts by sealing gaps that are too big to close with weatherstripping. When not in use, simply hang the sock on the doorknob.

*Part 3*

# Water Use

# Water Use

**We live in a country that is rich in fresh water, so it's understandable that Canadians tend to take this resource for granted. Water is as close as kitchens, bathrooms and laundry rooms in most Canadian homes. As soon as we turn on the tap, there it is, flowing freely. But it's not free – especially hot water. In fact, 15 percent of a typical energy bill goes to heating water. While you can't do without water, there are ways you can use less and save money. Also, leaks can be costly. A leak of only one drop per second wastes about 9000 litres of water per year, or the equivalent of 16 baths every month. Most leaks are easy to find and fix at very little cost.**

## In the Bathroom

### Showers

166 Energy-efficient shower heads conserve energy without changing water pressure. Low-flow shower heads use up to 60 percent less water than standard fixtures. Flow restrictors, on the other hand, reduce water use from 19 to 11 litres per minute and can save up to 15 percent on your hot water bill.

167 Consider a low-flow shower head with a shut-off button. The advantage of the shut-off button is that it allows you to be very water efficient – you can interrupt the flow while you lather up or shampoo and then resume at the same flow rate and temperature.

168 In the bathroom, a flow rate of 2 litres per minute should significantly reduce water consumption but also let you enjoy your shower.

169 Take quick showers instead of baths; you'll use up to 50 percent less hot water. A five-minute shower, for instance, uses less than 38 litres of water, compared with 57 to 95 litres for a bath.

### Toilets

170 Installing a water-saver flush kit in your toilet will save thousands of litres of water per year. You can also replace large-volume toilets with units that use only six litres per flush – you'll reduce water usage by 70 percent or more.

171 Using the toilet as a wastebasket or flushing it unnecessarily wastes a lot of water.

172 A toilet that continues to run after flushing, if the leak is large enough, can waste up to 200 000 litres of water in a single year! To find out if your toilet is leaking, put two or three drops of food colouring in the tank at the back of the toilet. Wait a few minutes. If the colour shows up in the bowl, there's a leak.

173 If your toilet leaks, make sure that the flush valve or flapper valve is sitting properly in the valve seat. Also check that the flush valve lift wires are not bent or misaligned and that the valve seat is not corroded. All of these can be fixed easily and inexpensively. If, however, the leak is around the base of the toilet where it sits on the floor, call a professional.

174 Install a water-saving device inside the tank at the back of the toilet. The most common water retention device available is the toilet dam. When installed properly it will save about 5 litres per flush.

175 A plastic bag or bottle filled with water and suspended inside the toilet tank could be a water displacement device that's easy to find and install. However, don't use a brick! It can disintegrate inside the toilet tank, leading to excessive leakage at the flapper valve and may even be heavy enough to crack the tank.

176 Monitor the performance of the devices periodically. If you discover that it becomes necessary to double flush the toilet, something needs to be adjusted or replaced. Remember: double flushing defeats the purpose of your water conservation efforts and is costing you money.

177 If you decide that it's time for a toilet replacement in your home or business, you are well on your way to significant water savings that you can bank on over the life of the toilet. Replacing an 18-litre-per-flush toilet with an ultra-low-volume (ULV) 6-litre flush model represents a 66 percent savings in water flushed and will cut indoor water use by about 30 percent.

178 Remember, the ULV toilet not only uses less water, it produces less wastewater. If your municipality applies a sewer surcharge on your water bill, the investment in the better toilet could translate into a 50 percent reduction in your combined water/sewer bill. If your home uses a private well and septic system, you can significantly reduce the load on your tile drain field while extending its useful life.

179 If you run the tap while shaving, money is going down the drain along with your whiskers. Partially fill the basin with hot water – you'll save a lot of hot water.

## In the Kitchen

180 Rinsing dishes under the tap also wastes a lot of water. Rinse your dishes in a large bowl of water, or partially fill one side of a double sink. Here's another approach: slowly pour a bowl of water over dishes after putting them in the drainer.

181 If you wash your dishes by hand, you use more water and energy than if you use an automatic dishwasher.

182 Fix leaking faucets as soon as possible. A hot water faucet that leaks one drip per second will waste 9000 litres per year. That's enough water for 160 full cycles on an automatic dishwasher.

183 Keep a bottle of drinking water in the refrigerator rather than letting your tap run to get cold water when you want a drink. (Rinse the bottle every few days.)

## Outdoor Water Consumption

184 If you use water provided by your municipality, the water is usually pumped from a source and treated with chemicals before you use it. Then it is treated again before it is put back into the environment. All this movement and treatment of water takes energy, and producing this energy contributes to greenhouse gas emissions. The use of electricity or natural gas for your hot water heater further adds to greenhouse gas emissions. So, the less water used, the fewer emissions produced.

185 More than 50 percent of the water applied to lawns and gardens is lost due to evaporation or to run-off because of overwatering. Find out how much water your lawn really needs. As a general rule, most lawns and gardens require little more than 2 to 3 cm (1 in.) of water per week.

186 To reduce losses due to evaporation, water early in the morning (after the dew has dried).

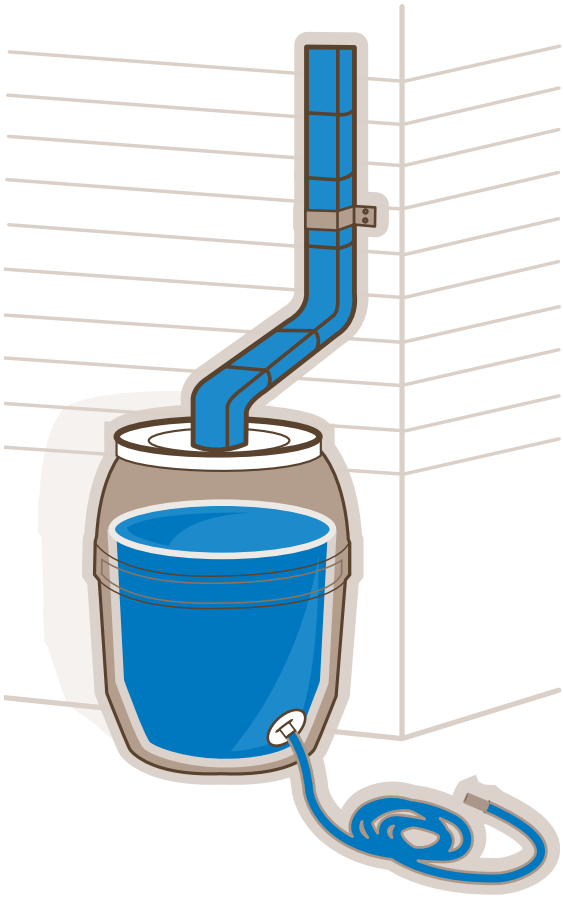
187 Ideally, sprinklers should be suited to the size and shape of the lawn. That way, you avoid watering driveways and sidewalks. Sprinklers that lay water down in a flat pattern are better than oscillating sprinklers, which lose as much as 50 percent of what they disperse through evaporation.

188 Installing timers on outdoor taps can be a wise investment.

189 The water you use to water your lawn doesn't have to come out of a tap. A cistern, which captures and stores rainwater, can be used as a source of irrigation water. A rain barrel can adequately fulfil this function.

190 The most significant savings come from a reduction in lawn area and switching from exotic plant forms to native species that require less water. In general, lawn areas should not exceed what is useful for play and social activities and should be limited to the spaces where the family spends its time.

191 When washing a car, fill a bucket with water and use a sponge. This can save about 300 litres of water.



192

Consider a low-maintenance landscape – one that requires little more water than nature provides. Often called xeriscaping, the principles of a low-maintenance landscape are as follows:

- ✓ a reduced amount of lawn
- ✓ proper plan selection that makes use of native grasses, shrubs and trees
- ✓ the use of rain barrels/roof drainage
- ✓ mulching to reduce evaporative losses around shrubs and trees
- ✓ a proper irrigation system
- ✓ planned maintenance

# Hot Water Heaters

193 Examine your water heater – if its surface is hot or even warm, some of the energy used to heat the water is being wasted. Wrap the heater in an insulating blanket. Be sure to check your user's manual and labels on the tank first.

194 Some new water heaters have insulation and are highly energy efficient. Adding a blanket may not make much difference.

195 Shopping for a new water heater? Look for a high-efficiency unit. Some new models heat water only when you need it rather than storing hot water in a tank.

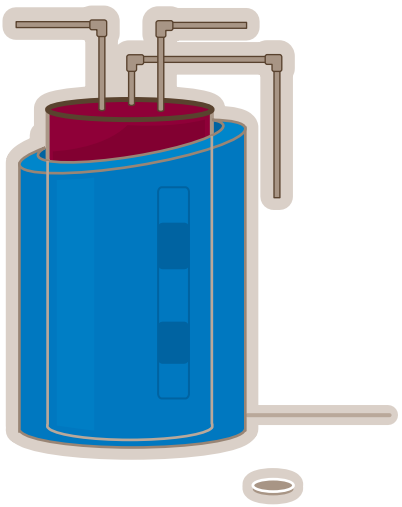
196 When installing a new hot water tank or designing a new home make sure that you place the unit as close as possible to the kitchen, laundry and bathrooms. Heat is lost in long pipe runs. For instance, reducing a hot water pipe from 10 to 3 metres will save enough energy in one month to heat water for 10 showers. Similarly, thin pipes are more energy efficient than thicker pipes; larger amounts of hot water are trapped in thicker pipes, and more heat is lost.

197 To help reduce heat loss, always insulate hot water pipes, especially where they run through unheated areas such as basements and crawl spaces. Insulate the first three metres on cold water pipes and the first two metres on hot water pipes running to and from tanks. This can save you about 2 percent on your heating bill and can reduce pipe-sweating problems in the summer. Do not place any pipe-wrap insulation within 15 cm of exhaust vents at the top of water heaters, and never insulate plastic pipes.

198 Many water heating tank manufacturers pre-set the temperature of the tank to 60°C (140°F). You can lower the thermostat to as low as 55°C (130°F) to save energy. Do not set it any lower, as this would risk the growth of disease-carrying bacteria such as legionella.

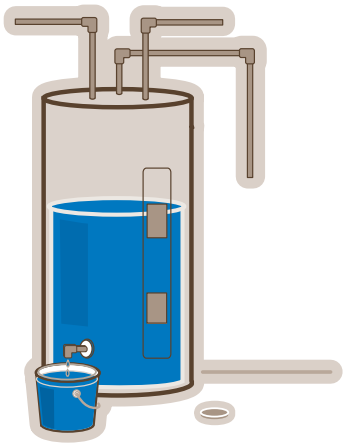
If you are concerned about the possibility of scalding at 55°C, a plumber can install a tempering valve that reduces the delivered water temperature, while maintaining a safe temperature in your tank. Tempering valves can also be installed on individual taps where the risk is greatest to children, the infirm or elderly. A professional installer will be able to provide you with specific details about the best way to do this in your home.

Note: Some older dishwashers need to have the water at 60°C (140°F) in order to work properly. If your dishwasher doesn't have an element to boost the temperature, you may have to set the thermostat at 60°C. If you do, set the thermostat exactly at 60°C. Temperatures higher than this can shorten the life of glass-lined water heaters.



199 Turn down your water-heater thermostat to a minimum setting when you plan to be away for extended periods of time.

200 Twice a year, or monthly if you live in an area that has heavy mineral deposits in the water, empty a bucket of water from your hot water heater. The drain cock is usually found at the bottom of the unit. Be careful: the water in the tank is especially hot. If you can, drain the tank when the water is cold.



201 Never store anything on top of natural gas water heaters. Make sure that combustion air openings at the bottom of these tanks – and openings below the draft diverters at flue ducts on top – are always kept unblocked.

202 For additional energy-saving tips, read the user's manual for your home's hot water heater.

*Part 4*

# Major Appliances

# Major Appliances

**When you're shopping for new major appliances, remember that these items really have two price tags: the purchase price and the operating price. Although some energy-efficient appliances may cost more to buy, they'll save you money on your monthly utility bill. Over the life of a good appliance, which might be 10 to 15 years, the savings will more than cover the higher purchase price.**

## 203 Appliance Recycling

Is it time to say goodbye to your old refrigerator/freezer, stove, washing machine or dryer? Appliance-recycling programs are available in many Canadian communities and through provincial utilities. Old appliances are collected for proper disposal. CFCs, or chlorofluorocarbons, are removed if necessary. CFCs are the gases that cool refrigerators and freezers. If not recovered properly, CFCs escape and damage the atmosphere's ozone layer. Contact your city or municipality to find out how to dispose of your old appliances safely.

## Refrigerators

204 Accounting for up to 11 percent of your household's total energy use, your refrigerator can have a major impact on your energy bill.

205 Fortunately, today's refrigerators are much better energy performers than older models because they have to meet tougher Government of Canada regulations. Superior refrigerator design, more efficient compressors and better insulation and door seals have contributed to improved energy efficiency.

206 Make sure that your refrigerator is kept away from all sources of heat, including direct sunlight, furnace vents, radiators and appliances such as the oven, cooking range and dishwasher.

207 Refrigerator motors and compressors generate heat, so allow enough space for continuous airflow around your refrigerator. If the heat can't escape, the refrigerator's cooling system will work harder and use more energy.

208 Many Canadians keep a second refrigerator in the basement or garage to hold extra food and drinks. Why not just buy a larger and more energy-efficient refrigerator instead? That way you'll save on energy and maintenance costs by running one unit rather than two. If you must keep a second refrigerator, you can save up to 20 percent on its energy cost by topping up the unit's coolant.

209 If you must keep a spare refrigerator or freezer in your garage, make sure that the space is well ventilated in summer. A hot garage will make your refrigerator use much more energy. (Note: Space that's too cold may affect the viscosity of the oil in the unit and wear it down.)

210 Keep spare refrigerators and freezers plugged in only if absolutely necessary.

211 A full refrigerator is a fine thing, but be sure to allow adequate air circulation inside.

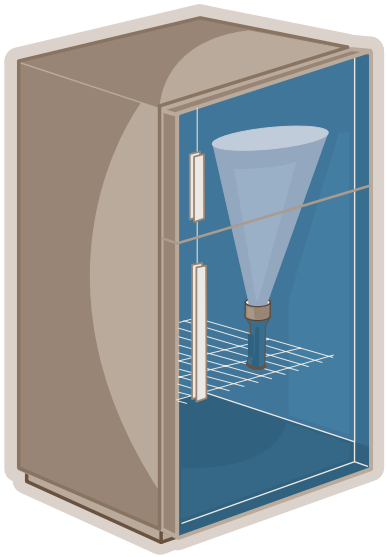
212 Keep your refrigerator's temperature between 1.7°C and 3.3°C (35°–38°F). The freezer compartment should be kept at –18°C (0°F) for maximum efficiency and food safety.

213 Think about what you need before you open your refrigerator. You'll reduce the number of times you open the refrigerator door and the amount of time the door remains open.

214 Allow hot and warm foods to cool and cover them well before putting them in your refrigerator. You'll use less energy and reduce condensation.

215 Frozen foods should be allowed to defrost in the refrigerator; the cool air from the packages will help maintain coolness.

216 Make sure that your refrigerator's rubber door seals are clean and tight. They should hold a slip of paper snugly. If paper slips out easily, replace the door seals. Here's another way to check the seals: when it's dark, place a lit flashlight inside the refrigerator and close the door. If you can see light around the door, the seals need to be replaced. Use the flashlight to check on freezers and ovens as well.



217 When dust and pet hair build up on your refrigerator's condenser coils, the motor works harder and uses more electricity. Clean the coils regularly to make sure that air can circulate freely.

218 For manual defrost units, maintaining an accumulation of ice that is 0.6 cm ($\frac{1}{4}$ in.) thick will contribute to cooling and permit your refrigerator's freezer to run efficiently. Too much ice, however, reduces the cooling power by acting as unwanted insulation. Defrost your freezer compartment regularly.

219 Manual-defrost refrigerators are generally more energy efficient than frost-free models, requiring fewer cooling and heating parts. However, to make the most of the energy savings, manual-defrost refrigerators must be properly maintained according to manufacturers' instructions.

220 Read your refrigerator's user's manual to make sure that you're taking full advantage of the energy-saving features of your unit.

## EnerGuide

221 Consumers have never before enjoyed such a range of choice in refrigerators. But the choices can be confusing. Refer to the EnerGuide label and the *EnerGuide Appliance Directory* (available on-line at oee.nrcan.gc.ca/appliances) to compare the energy consumption of all types and sizes of new refrigerators. The EnerGuide label shows energy consumption in kilowatt hours (kWh) per year. The lower the number, the more energy efficient the appliance.

# 222

## Shopping for a new refrigerator?

If you're shopping for a new refrigerator, consider buying an energy-efficient one. On average, it uses at least 36 percent less energy than models made 10 years ago.

# 223

## ENERGY STAR Facts

- ✓ ENERGY STAR qualified refrigerators include frost-free, top-mounted, bottom-mounted and side-by-side units.
- ✓ If your refrigerator is at least 10 years old, it uses as much electricity as two ENERGY STAR qualified refrigerators.
- ✓ ENERGY STAR qualified refrigerators use at least 10 per-cent less electricity than those that meet Canada's minimum energy-performance standards.
- ✓ A new ENERGY STAR qualified refrigerator uses less than one third the electricity of a refrigerator built in 1984. That will save you more than $80 per year.

# 224

## Refrigerator Facts

The humming sound coming from your refrigerator is the compressor. If your refrigerator is new, you may have noticed that the compressor seems to run longer than the one in your old refrigerator, which stopped and started more often. Today, more efficient compressors run more efficiently when running at their steady state, meaning that there are fewer temperature swings, which tend to increase energy usage in older models.

Longer running cycles maintain a more stable inside temperature and lower your operating costs.

# Freezers

225 As with your refrigerator, test the seals of your freezer door by closing it on a sheet of paper. Replace the seals if the paper slides out easily (see tip 216).

226 Fully defrost and clean the inside of your freezer at least once a year.

227 Vacuum dust from the back and underside of your freezer regularly.

228 Don't place warm food or pots in the freezer.

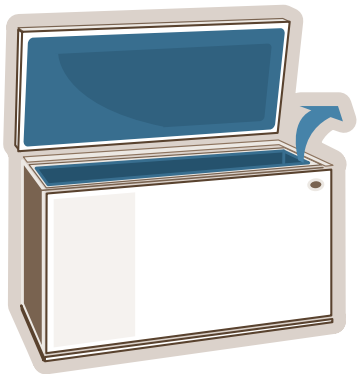
229 Place the freezer away from all sources of heat. Also make sure that your freezer is at least 5 to 7 cm (2 to 3 in.) from the wall so that air can move freely around the unit.

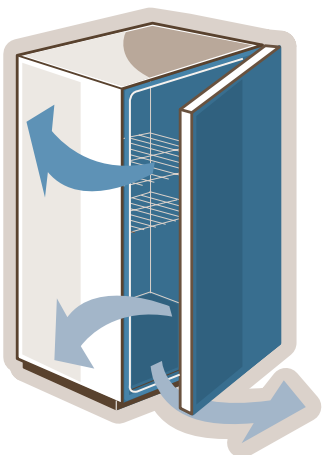
## 230 A Chilling Thought

The ideal temperature for freezers is –18°C (0°F). For each degree below this temperature, the freezer will use almost 2 percent more energy. At –20°C (–4°F), for example, the freezer will be using 4 percent more energy than it needs, and that will cost you money. Install a freezer thermometer inside the freezer to gauge temperature.

## 231 Looking to Buy?

- ✓ If you're shopping for a new freezer, consider a new energy-efficient model. Freezers made in 2002 use less than half the electricity consumed by those made 10 years earlier.
- ✓ Chest freezers are generally more energy efficient than upright models. That's because lifting the door on a chest unit releases less of the freezer's cold air. Open the door on an upright freezer, however, and the cold air flows down and out.
- ✓ Check the EnerGuide label for the lowest kWh consumption per year.





# Cooking Stoves

**Smart cooks not only save energy by cooking more efficiently, they also spend less time in the kitchen. Here's some helpful advice for the chefs in your home.**

## Cooktops

232 Match your pot to the size of the cooking element. The base of the pot should just cover an electric cooking ring. If the pot is too large for the element, more energy will be required to heat the pot. If the pot is too small, energy is wasted.

233 Make sure that the bottoms of your pots and pans are smooth and flat. Food will cook faster and you'll use less energy when the pots make full contact with the cooking element.

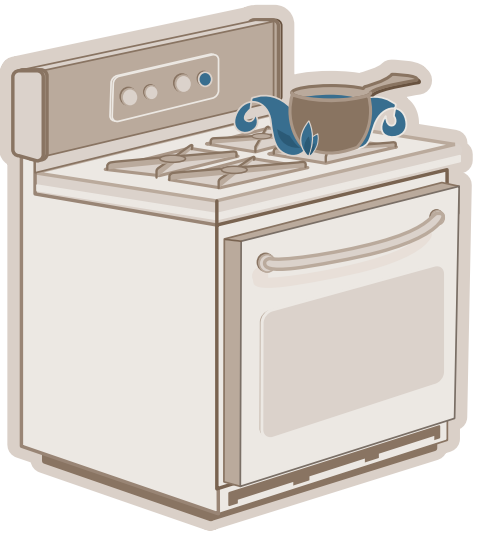
234 Make sure that lids fit tightly on pots and, when possible, keep lids on when cooking. This traps heat in the pots and lets you lower the temperature of the cooking element. Not only will you use up to 20 percent less energy, your food will also cook more quickly and evenly.

235 Use minimum heat. Once water is boiling, for instance, turn the heat down to the lowest setting that will maintain boiling. A higher setting will not cook your food any faster.

236 Turn off the heat two or three minutes before the end of the proper cooking time. The element will stay hot, food will continue to cook – and you'll save money!

237 Keep drip pans under the cooking elements clean. Don't line the drip pans with aluminum foil – this may reflect heat away from the pot and damage the elements.

238 When cooking with gas, make sure that the flame heats only the bottom of the pot. It's not only dangerous for the flame to reach the side of the pot, it's also a waste of energy.

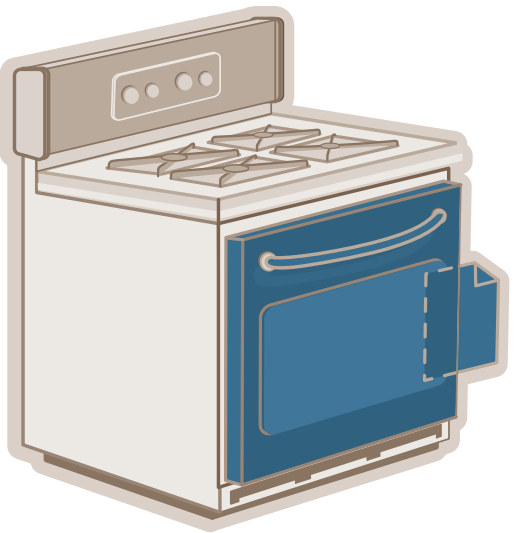


239 Read your user's manual to make sure that you're using your appliance properly.

## Ovens

240 Preheated ovens are required mostly when baking bread and pastry; for other foods, preheating is not always necessary. Remember: every 10 minutes of preheating uses 0.06 kWh. That adds up to a lot of energy over time.

241 Make sure that the oven door seal is tight (see tip 216).



242 No peeking! Every time you open the oven door, at least 20 percent of the heat is lost. Check food through the oven door window instead.

243 Turn off the oven 10 minutes before your baking is done. The heat in the oven will finish cooking the food.

244 If possible, use your cooktop, toaster oven or microwave oven to reheat foods. These appliances use less energy than standard ovens.

245 Over time, food drippings and spills may build up in your oven. Self-cleaning ovens remove these buildups by baking them off at very high temperatures. To use less energy, run the self-cleaning cycle when the oven is still hot, right after you've finished cooking.

246

## Looking to Buy an Oven?

✓ You'll spend a little more to buy a self-cleaning oven, but you'll also save money over the life of the appliance. That's because self-cleaning ovens are usually better insulated than standard ovens. As a result, every time you cook you lose less heat, use less energy and save money. Check the EnerGuide label.

✓ Convection ovens contain fans that keep heat moving throughout the cooking space. Not only do these ovens cook more evenly, they also cook faster. That way you use less energy and have more time to enjoy the results!

# Dishwashers

247 Regularly clean the filter at the bottom of your dishwasher to keep the machine running efficiently.

248 Run your dishwasher only when full, and use the setting that offers the best wash in the least amount of time. Check your dishwasher's manual for the settings that work best for you.

249 When you use your dishwasher's drying cycle, an electric element heats the interior of the unit and evaporates all the water. To save energy, select the dishwasher's no-heat drying cycle (also called air drying).

250 Some people rinse their dishes in the sink before putting them in the dishwasher. Don't bother – you'll save more water and energy by scraping all excess food off plates and cutlery. Your dishwasher will do the rest.

251

## Looking to Buy?

✓ Today's dishwashers are about 95 percent more energy efficient than those built in the early 1970s, so replacing your old dishwasher may save you a lot of money and water over the life of the appliance.

✓ Most new dishwashers offer energy-saving features, such as short, light or economy cycles. These cycles clean your dishes in one detergent wash followed by two or three rinses. You're also given the option of heat or no-heat drying.

252

## EnerGuide

✓ When shopping for a new dishwasher, consult the EnerGuide label. It shows you how much electricity the dishwasher uses each year, based on 268 normal wash cycles per year.

✓ Lower EnerGuide ratings mean that the unit uses water more efficiently because at least 80 percent of the rating takes into account the energy used by a storage water heater to heat the water used by the appliance.

253

## ENERGY STAR

Dishwashers that meet ENERGY STAR performance levels are at least 25 percent more energy efficient than comparable dishwashers. ENERGY STAR qualified dishwashers save energy and water by using improved washing technology and better rinsing systems. Some of these models feature built-in electric water heaters that can save you up to 10 percent on energy costs.

254

## New Energy-Saving Technology

How dirty are your dishes? Some new dishwashers can tell. They can figure out exactly how much water will be required to clean your dishes efficiently, so there is no wasted energy and no wasted water. Such appliances have sensors that scan the amount of food left on dishes and set the water usage accordingly.

# Clothes Washers

255 Studies show that clothes rinsed in cold water come out just as clean as those rinsed in warm water. Rinse in cold water and you'll save money on your water-heating bill. To save even more, wash in warm water rather than hot – you'll use 50 percent less energy, and your clothes will come out better rinsed and less wrinkled.

256 If you have a load of clothes that are extra dirty, use your washing machine's pre-soak cycle instead of washing your clothes twice.

257 Clothes washers are most energy efficient when they're fully loaded. That's why it's important to buy a machine that matches your family's needs.

258 If your machine has a water-level selector, make sure that you choose the correct setting for each load.

259 Whenever possible, place your washing machine close to your hot water heater to reduce heat loss in the connecting pipes. Wrap any exposed pipes with insulation, especially where they are close to cold concrete walls.

## 260 Front-Loading Versus Top-Loading

The drums in front-loading washers only look smaller than those in top loaders. That's because traditional top-loading washers need agitators – the large posts set in the middle of the drum. Both types of machines wash about the same amount of clothes; however, front-loading washers use about 40 percent less water per load and 50 percent less energy than top-loading washers. Front-loading machines also use less detergent.

## 261 ENERGY STAR

Clothes washers that meet ENERGY STAR performance levels save more energy and water than other machines. For example, ENERGY STAR labelled washers feature high-efficiency motors that spin clothes faster to remove more water. That means that less time and energy are needed to dry the clothes.

ENERGY STAR qualified clothes washers:

- ✓ use less than 400 kWh of electricity per year
- ✓ use about 40 percent less water per load but perform just as well
- ✓ include front- and top-loading models
- ✓ feature a sensing technology that measures the weight of the load and automatically sets the water level

## 262 EnerGuide

The EnerGuide energy rating is based on 392 normal wash cycles per year and includes the amount of energy used to heat the water.

# Clothes Dryers

263 Don't put dripping wet clothes into your dryer; your machine will have to work harder and use more energy. Wring the clothes out or spin them in the clothes washer first.

264 If possible, sort your clothes by thickness. Dry the thin, quick-drying items in one load and thicker items, such as towels, in another.

265 Try to start your second load of drying as soon as the first is finished. That way the dryer will still be warm, and you'll save energy.

266 Don't leave clothes in the dryer too long. Over-drying not only uses more electricity, it sets wrinkles in your clothes and causes more shrinkage. Clothes should dry in 40 to 60 minutes.

267 To save money and reduce clothes shrinkage, you can also use your dryer's cool-down cycle (usually the permanent-press setting). No heat is supplied in the last few minutes, but drying continues as cool air is blown through tumbling clothes.

268 Allow slightly damp clothes to finish drying by hanging them in your laundry room or on your clothesline. (Don't do too much drying indoors during the winter, as this may cause a buildup of moisture and cause condensation problems.)

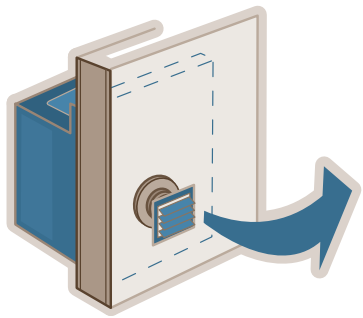
## Installation and Maintenance

269 When installing your dryer, read the owner's manual and follow the instructions carefully.

270 Always vent your dryer to the outside of the house. Some people believe that venting into the house saves heat, but it also leads to a buildup of moisture, odours and lint. For safety reasons – and by law – natural gas dryers must never be vented inside the home.

271 Make sure that your dryer ducting is the right size and length. Generally, metal ducting is more energy efficient than ribbed plastic-coil types, especially when long runs are needed.

272 Make sure that your dryer's exterior exhaust duct opening – and the area around it – is clear of all debris. Lint often builds up on the movable shutters and keeps the hood from closing properly. Small animals have been known to nest in duct openings, which offer warmth in the winter.



273 Once a year, disconnect and clean the dryer moisture exhaust duct. It should be free of lint, dust and pet hair. The duct should also be completely round, not kinked, to ensure that dryer exhaust travels easily to the outside.

274 Empty the lint screen after every load. Once a year, wash the lint screen with a toothbrush and detergent to remove film left by fabric softeners and dryer sheets. Your dryer will work better and use less energy.

275 Make sure that you replace your dryer's exhaust hood if it becomes broken or rusted open.

### 276 "On-Line" Drying

Don't forget about your outdoor clothesline – think of the energy savings and the fresh-air smell!

### 277 Looking to Buy?

Many dryers now come with sensors that automatically shut off the dryer when your clothes are dry. This saves energy and reduces the wear and tear on your clothes.

*Part 5*

# Small Appliances

# Small Appliances

**Together, small appliances use a great deal of energy. Think about it: they're used in the kitchen – one of the busiest rooms in your home – from early morning until late at night. And there's often more than one of these appliances on at the same time.**

**To save money throughout the year, use small appliances wisely and make sure that they are clean and well maintained.**

## Toaster Ovens

278 Heating up a few leftovers? A toaster oven uses much less energy than a regular oven and is perfect for heating small quantities of food.

279 Don't overfill your toaster oven. Make sure that air can move freely around inside and outside the appliance.

## Microwave Ovens

280 Microwaves save energy by reducing cooking times. In fact, you can save up to 50 percent on your cooking energy costs by using a microwave oven instead of a regular oven, especially for small quantities of food.

281 Remember, microwaves cook food from the outside edge toward the centre of the dish, so if you're cooking more than one item, place larger and thicker items on the outside.

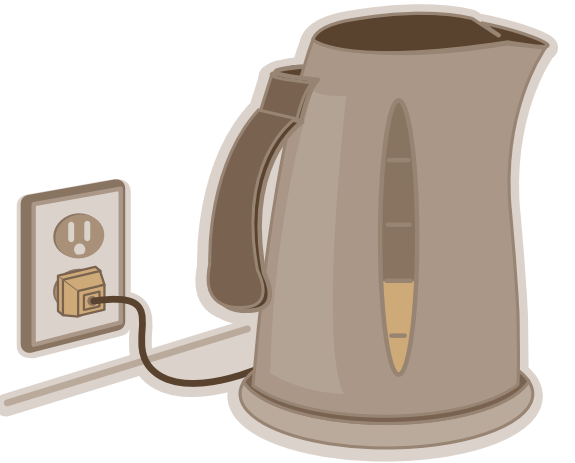
## Electric Kettles

282 Use an electric kettle to heat water. It's more energy efficient than using a cooktop element or even a microwave.

283 When buying a new electric kettle, choose one that has an automatic shut-off button and a heat-resistant handle.

284 It takes more energy to heat a dirty kettle. Regularly clean your electric kettle by combining boiling water and vinegar to remove mineral deposits.

285 Don't overfill the kettle for just one drink. Heat only the amount of water you need.



*Part 6*

# Lighting

# Lighting

286 Because of our long winter nights, Canadians rely heavily on electrical lighting. Controlling your use of lighting is one of the easiest and cheapest ways to cut down on energy costs.

287 One of the best energy-saving devices is the light switch. Turn off lights when a room is not occupied.

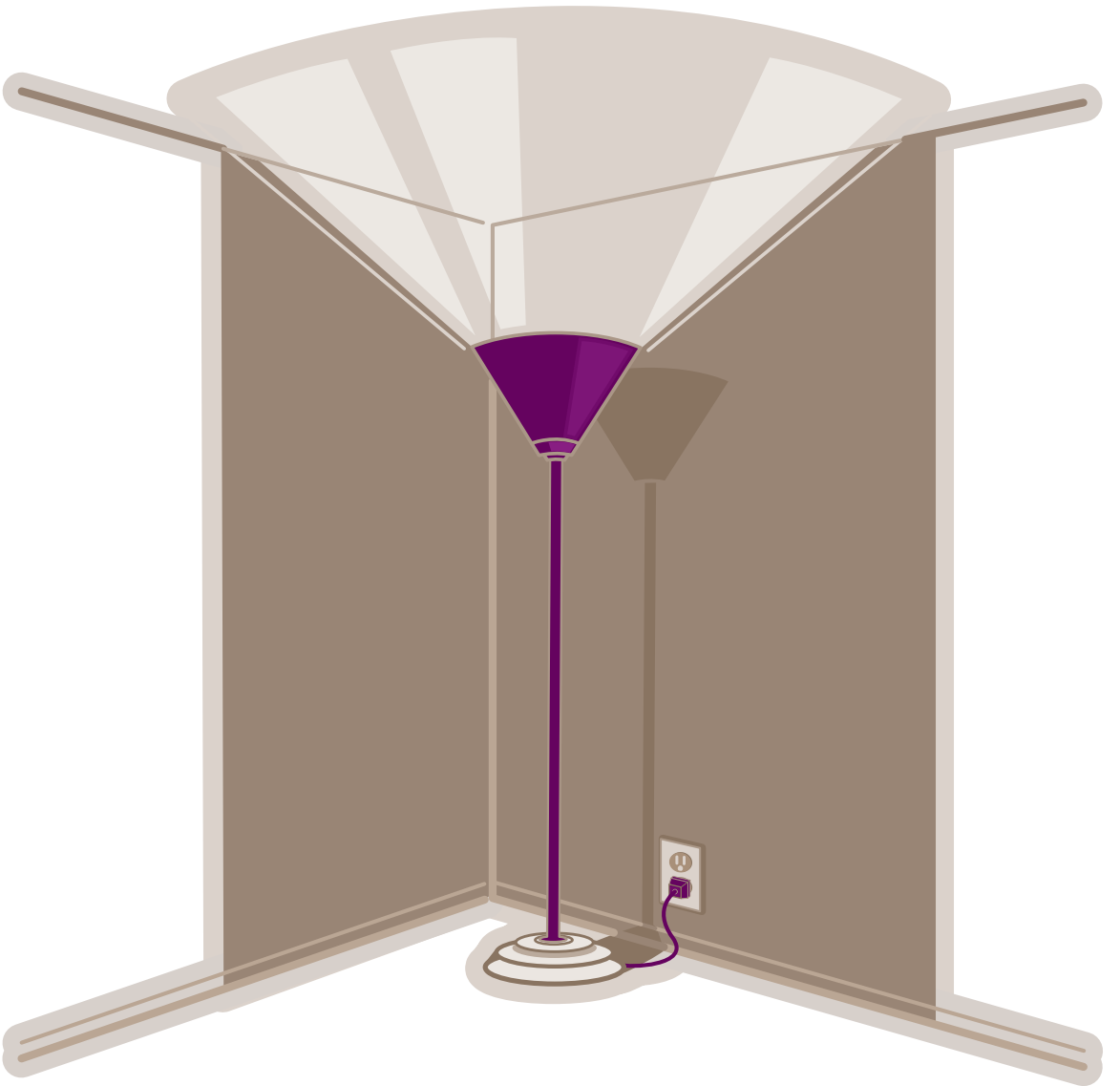
288 Many devices help save energy used in lighting. Look for automatic timers, motion sensors, dimmers and solar cells.

289 Try placing a lamp in the corner of a room; the light will be reflected off both walls and the ceiling to provide better overall illumination.

290 Use task lighting, which focuses light where it's needed. A reading lamp, for example, lights only your book rather than the whole room.

291 If you always forget to turn off the lights, consider doorframe switches that turn lights on and off as doors are opened and closed. These are especially handy for closets.

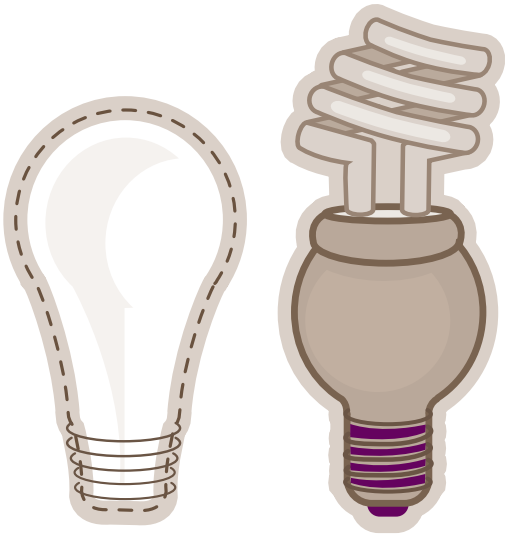
292 Dirty bulbs reflect less light and can absorb 50 percent of the light; dust your light bulbs regularly.



293 Swap your energy-guzzling incandescent light bulbs for more efficient types. Compact fluorescent bulbs use up to 75 percent less electricity than incandescents. Compact fluorescents cost more but last up to 10 times longer, so they quickly pay for themselves over time.

294 Choose the most efficient type of light for each application. Compact and tube fluorescent lights are the most energy efficient but are best used in areas where lights are left on for long periods.

295 Halogen lighting produces a more intense and focused light; its bulbs use up to 40 percent less energy than traditional bulbs. Halogen lighting is also excellent for gardens and pathways.



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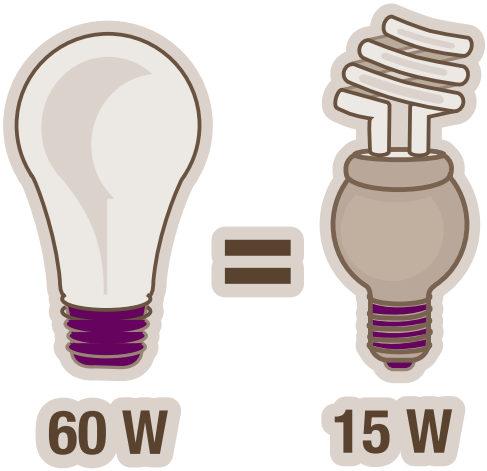
## Did You Know?

A 15-watt compact fluorescent bulb produces the same amount of light as a 60-watt incandescent bulb.




297

## Move and Save!

Do you find that your home's outside lights are often left on when they're not needed? Here's a money-saving solution: install lights that have built-in motion detectors. They can help you cut the energy use of your outside lights by as much as 50 percent. These lights switch on automatically when people move close to them and switch off after a few minutes when movement has stopped.

*Part 7*

# Home Offices

# Home Offices

**Personal computers make it easy for Canadians to bring their work home and turn extra rooms into home offices. These work spaces contain many electrical devices, including monitors, fax machines, printers and scanners. And because people are working from home, energy use increases throughout the house during the day.**

**Here are some handy tips for saving energy and money in your home office.**

298 Turn off your home office equipment when not in use. A computer that runs 24 hours a day, for instance, uses between $75 and $120 worth of electricity each year – more power than an energy-efficient refrigerator. In standby mode, your PC's energy use can be reduced to $15 per year.

299 If your computer must be left on, turn off the monitor; this device alone uses more than half the system's energy.

300 Fluorescent desk lamps consume about a quarter of the energy of an incandescent unit, give off the same amount of light and last about 10 times longer.

301 Battery chargers, such as those for laptops, cell phones and digital cameras, draw power whenever they are plugged in and are very inefficient. Pull the plug and save.

## 302

### Replacing Your Computer?

Don't toss it in the garbage. Computers contain lead and heavy metals that are dangerous to the environment. There are many agencies that are glad to receive donated computers. Your municipality may have a "take back" program that identifies companies or organizations that take back old computers.

## 303

### Computer Myths

Screen savers save computer screens, not energy.

Start-ups and shutdowns do not use any extra energy, nor are they hard on your computer components. In fact, shutting computers down when you are finished using them actually reduces system wear – and saves energy.

# 304

## Looking to Buy?

- ✓ Look for the ENERGY STAR symbol, which identifies the most energy-efficient home office equipment. The ENERGY STAR symbol means that the computer was shipped from the manufacturer with the energy management features in the operating system switched on. To maintain energy savings, leave them on or adjust them to your work flow.
- ✓ Buy a monitor that is the right size for your needs. In general, the larger the monitor, the more energy it consumes.
- ✓ If you are buying a laser printer, look for one that has an energy-saver feature mode that automatically steps down the unit to standby mode and reduces electricity use by more than 65 percent.
- ✓ ENERGY STAR labelled scanners do not cost more than other models; however, they do offer energy-saving features that set scanners to sleep mode when idle. These features may also save you money by prolonging the life of the scanner's light sources. (ENERGY STAR qualified scanners automatically power down to 12 watts or less after a period of inactivity.)
- ✓ ENERGY STAR labelled fax machines have power-management features that cut energy costs by as much as 50 percent. (ENERGY STAR qualified fax machines automatically enter a low-power mode of 15 to 45 watts or less after a period of inactivity.)

*Part 8*

# Vehicles

# Vehicles

**You've checked your home inside and out to improve energy efficiency. If you're looking for more savings, head for the garage or driveway – your car or light truck may not be a gas-guzzler like those of the 1950s and 1960s, but it still accounts for a major part of your annual energy costs.**

**There are many ways you can save energy and money and help protect the environment while operating your car.**

305 Use the *Fuel Consumption Guide* to help you choose the most fuel-efficient vehicle that meets your everyday needs. It will help you reduce your fuel consumption and fuel costs.

306 Ethanol-blended gasolines can help reduce greenhouse gas emissions, which contribute to climate change. Check your owner's manual to see if your vehicle will run on low-level ethanol-blended gasoline, which is available at nearly 1000 gasoline stations across Canada.

307 The use of other alternative fuels such as natural gas and propane also help reduce greenhouse gas emissions.

308 Aggressive driving saves very little time and substantially increases fuel consumption and exhaust emissions.

309 On the highway, maintain a steady speed and avoid inadvertent speeding. You'll use less fuel and save money.

310 If you're parked (except in traffic), don't let the engine idle – turn it off to protect the environment and cut your fuel costs. More than 10 seconds of idling uses more fuel than restarting the engine.

311 Remote car starters are handy on cold winter mornings, but don't start your car too soon. In most cases, today's modern engines need to warm up for only 30 seconds, even on cold winter mornings. Besides, allowing your car to idle too long wastes gas and produces unnecessary exhaust emissions.

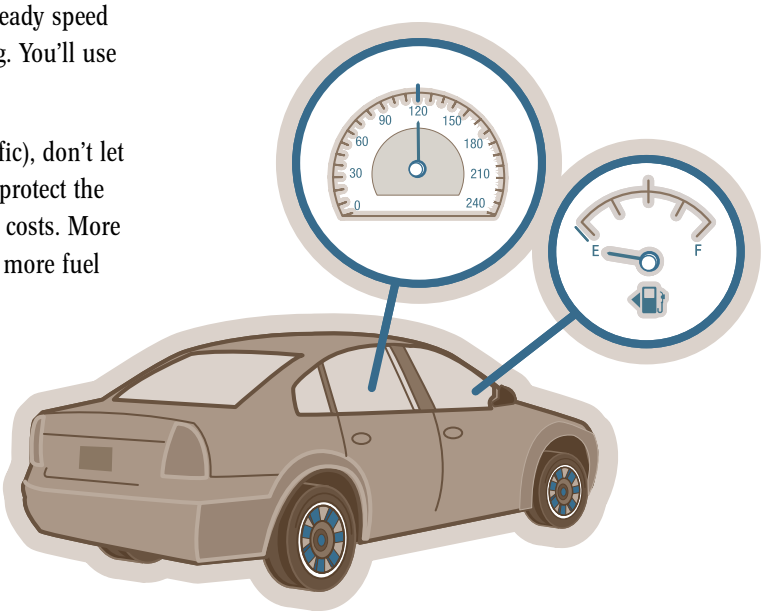
312 Plan your trips. Stay away from areas where you know the traffic is heavy. Combine errands to save fuel and time.

313 Don't use your vehicle's air conditioner unless it's absolutely necessary. Using your air conditioning in stop-and-go traffic can also mean using as much as 20 percent more fuel. To keep cool, consider using the ventilation system and options such as a sunroof and tinted glass.

314 One reason that many of today's cars are fuel efficient is their shape. Sleek and streamlined, they slice through the air, use less fuel and save you money. Attaching a roof rack cuts those savings. If you must have a roof rack, choose one that can be removed when not in use.

315 Poor wheel alignment and brake drag also increase fuel consumption. Check for uneven tire wear and have your vehicle serviced regularly.

316 Drive at the posted speed limit. Increasing your highway cruising speed from 100 km/h to 120 km/h can increase fuel consumption by about 20 percent.



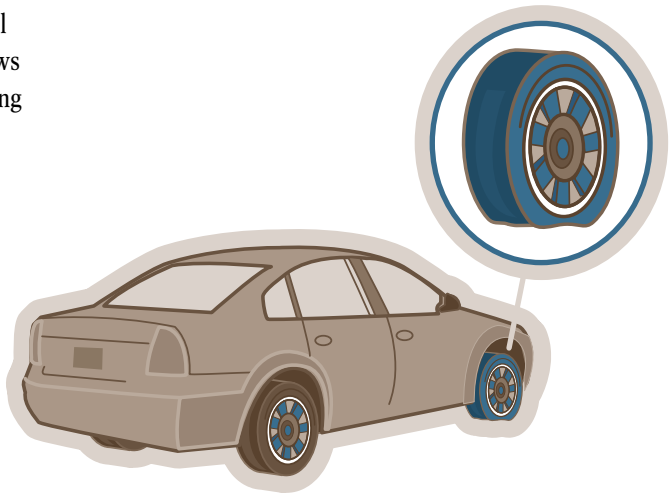
**317** To optimize your vehicle's fuel efficiency, follow the manufacturer's recommendations when maintaining your vehicle. Change the oil and filter regularly. Oil breaks down over time and loses its ability to lubricate, cool and protect your engine. Clogged air filters make your engine work harder, use more gas and produce more emissions. Make sure that your mechanic checks your vehicle's emissions system during routine servicing.

**318** Don't buy a bigger car than you need. Generally, the larger the car, the more fuel it will use. Options such as power windows and power seats add weight to cars, making engines work harder and burn more fuel.

**319** Four-wheel drive and all-wheel drive increase fuel consumption by as much as 5 to 10 percent due to the increased weight and friction of the additional drivetrain components.

**320** Whenever possible, walk, cycle, carpool or use public transportation.

**321** Check your tire pressure at least once a month. Take your measurements when the tires are cold (i.e., three hours after use or after driving a distance of less than 2 km). A vehicle driving on tires that are under-inflated by only 6 psi (pounds per square inch), or 40 kPa, can use up to 3 percent more fuel. Under-inflated tires are also unsafe and wear out faster.



## 322 Looking to Buy?

- ✓ There are many things to consider when buying a new vehicle. Make fuel efficiency one of them. A more energy-efficient vehicle will save you money every time you drive. Check the EnerGuide label on new vehicles. This label will tell you roughly how much fuel a vehicle uses in the city and on the highway. The label also provides information on the vehicle's annual fuel cost.
- ✓ Choose vehicle options that contribute to better fuel economy, such as tinted glass, cruise control, a block heater or aluminum wheels. Options that add weight and/or draw extra power from the engine, such as power seats and windows, heated seats, air conditioning, four-wheel and all-wheel drive, can increase fuel consumption.
- ✓ If you're buying a used vehicle, check the on-line *Fuel Consumption Guide,* which contains ratings for every light-duty vehicle sold each year in Canada since 1995. See the Web site at oee.nrcan.gc.ca/vehicles.

# 323

## A Chip Off the Old Block

Your vehicle's oil doesn't freeze when the temperature dips below 0°C (32°F), but it does become much thicker. So when you try to start a cold engine, it's as though the parts are moving through molasses instead of water. That means your engine has to work harder, so it uses more fuel. Using a block heater warms the oil and engine coolant and makes your vehicle easier to start – and that can improve winter fuel economy by as much as 10 percent. But don't leave your block heater on overnight; your savings will disappear in a bigger electricity bill. Use a timer to switch on the block heater two hours before you plan to drive.

324 Once a month, check fluid levels, including engine oil, engine coolant levels, transmission fluid and power steering fluid as instructed in the owner's manual. Also check around the car and under the engine for fluid leaks.

325 Engine oil is the lifeblood of your vehicle. Changing it regularly, according to the manufacturer's recommendations in your owner's manual, is the best way to keep your vehicle in top operating condition.

326 Reduce weight. If you add weight to the trunk or pickup bed of your vehicle in the winter months, don't forget to remove it when the snow melts. The extra weight just means wasted fuel and unnecessary emissions.

327 Plan your driving by looking ahead of traffic. Anticipate problems. Keep a "buffer zone" between your vehicle and the one ahead so you can avoid sudden braking and accelerating. Quick stops and rapid acceleration waste fuel.

328 Don't rest your foot on the brake pedal when you are driving. This strains the engine, uses more fuel, increases brake wear and decreases brake efficiency.

329 Use the proper grade of fuel. Using the proper grade of fuel recommended for your vehicle by the manufacturer will provide the best performance and lowest operating cost.

*Part 9*

# Yard Machinery, Pools and Cottages

# Yard Machinery

## Lawn Mowers and Rototillers

330 Tune up for spring – clean spark plugs and adjust carburetors and chokes. Replace transmission oil to help your machine run smoothly and use less energy.

331 Electric lawn mowers should be serviced in the spring. Check your operator's manual for instructions on cleaning and lubrication. Remove grass clippings from under motor hoods; this small precaution will help keep motors running smoothly and efficiently.

332 Watch your engine speed. Don't run gas-powered lawn mowers at full throttle unless the grass is long and thick.

333 Most gas-powered lawn machinery is air-cooled, which means that it must be kept moving. Leaving your machine to idle is not only hard on the engine, it also wastes gasoline and can be a danger to children and pets.

334 Gas-powered lawn machinery emits greenhouse gases that contribute to climate change; electric-powered lawn machinery does not emit such gases.

## Snowblowers

335 Each year, tune gas-powered snowblowers as you would lawn mowers. Clean spark plugs, adjust carburetors and chokes, and replace transmission oil to help snowblowers run smoothly and use less energy.

336 Use snowblowers only for moderate to heavy snowfalls. Clear away light snowfalls with shovels; it's good exercise, saves gasoline and reduces exhaust emissions.

337 Protect your snowblower from rust by clearing all snow and ice from the machine after each use. Try using a broom; it's strong enough to scrape away snow without scratching paint. And be sure to keep the carburetor clear – ice buildup can increase your snowblower's gasoline use.

338 Generally, electric snowblowers work best in light snow. You risk burning out the electric motor if you use these machines in deep, heavy snow. Check your instruction manual for details and for information on proper maintenance.

339 **Save Gas and Reduce Greenhouse Gas Emissions!**

Running snowblowers at full throttle wastes gas, creates more exhaust emissions and causes more noise. Save money by using only as much power as you need to clear away snow. Adjust snowblower throttles to the amount of snow – low throttle for light snowfalls and full throttle for blizzards and snowbanks.

Don't forget that using a shovel when possible saves energy and money!

# Pools

340 Use pump timers to regulate energy and the length of time your pool is heated.

341 Cover your pool with a thermal pool blanket to prevent heat from escaping and reduce water evaporation.

342 Use solar panels to heat your pool. They are very cost-effective.

# Cottages

## Boats

343 If you're near a lake, chances are that you own a boat of some kind. If you have a family that enjoys water skiing, you need a larger and more powerful motor. But you don't have to use this big one all the time. What do you use to go fishing early in the morning? Or to go on a little sightseeing trip? A smaller motor is more economical and will get you wherever you want to go – perhaps not as quickly, but you'll have more time to relax. And isn't that the whole idea?

## Snowmobiles

344 Snowmobiles can be a great help in the winter. But if you want to relax and get back to nature, why not strap on a pair of cross-country skis or snowshoes? You'll get some good exercise and see all the wildlife that goes into hiding whenever a snowmobile is near.

## Hot Water Heater

345 When you're heading home from the cottage, be sure to turn off the hot water heater. It's a waste of energy to keep water hot that isn't needed, and it won't take long to heat up when you return.

346 Remember to turn off the water heater each time you leave for a day or more. What's the sense of paying to heat hot water if you're a hundred miles away?

347 Read the user's manual for instructions on the safest way to turn off your hot water heater.

## Heating

348 Some heating units, particularly electrical ones, can be turned off at the unit; others have a thermostat that indicates "warm." If the weather turns cool, the heater will come on. This is a waste in summer if the cottage is empty. Check to see if your unit can be turned off completely; if not, switch it off at the fuse box.

349 Before you head home after the weekend, turn the heat off, either at the unit or the thermostat. If your water system is operating, you'll need some heat to keep the pipes from freezing, but you can still turn the heat way down. When you return, turn the thermostat up to the usual level. But don't set it higher because the building won't heat up any faster.

350 If you plan to use your cottage year-round, you will probably need to improve the insulation. Follow the ideas in Part 2: Housing.

## Closing Up in the Fall

351 If you don't use your cottage in winter, there are a few points to check when you leave for the last time in the fall. Drain the water from all taps. Defrost and unplug the refrigerator; be sure it's dry and leave the door slightly ajar. Turn off the main electric power switch as a double-check that nothing has been left on.

*Part 10*

# Waste Management

# Waste Management

**The average Canadian household throws out a tonne (1000 kg) of garbage every year. More than half of all solid waste collected in Canada is made up of consumer or household garbage. Reducing the amount of garbage ending up in landfill sites can reduce the amount of methane that is released into the atmosphere.**

352 Buy goods that are efficient, durable, more environmentally friendly and not over-packaged. These simple purchasing decisions can encourage a reduction in the amount of energy required to manufacture products.

353 Buy locally produced goods when possible to lower the amount of fuel used in transporting goods. If consumers demand more energy efficiency in bringing products to market, manufacturers and distributors will accommodate.

## Recycling

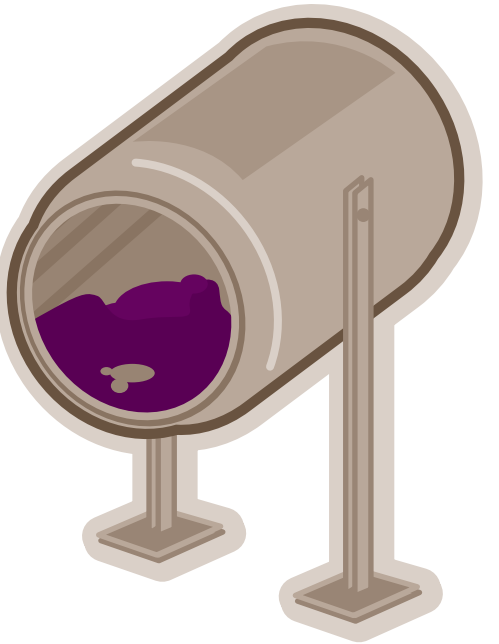
354 The energy saved from recycling one aluminum can is enough to run your television for three hours. Making the effort to recycle helps the environment and saves energy.

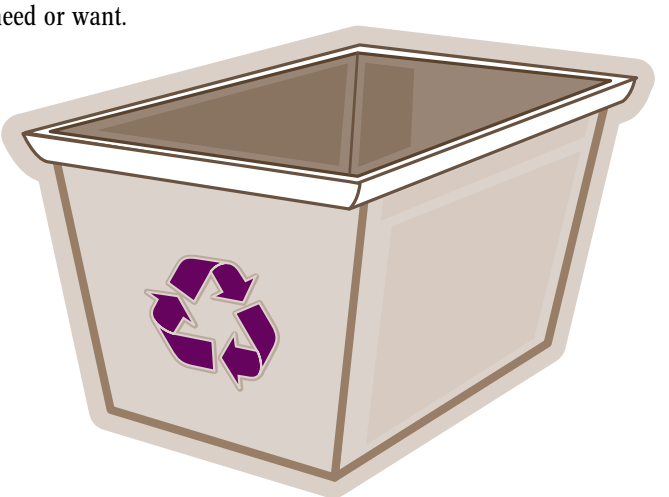
355 Products made from recycled materials require much less energy to manufacture. For example, die casting a part from recycled aluminum requires 95 percent less energy than using primary metal. Saving energy also means that less carbon dioxide is emitted into the atmosphere.

356 Repair or reuse items rather than buy new products. Give away – don't throw away – items you no longer need or want.

## Composting

**Many of your kitchen organic wastes can be transformed into valuable garden compost. For example, all your fruit and vegetable wastes, tea bags and coffee grinds and some eggshells (but not too many) can be composted. Many other organic materials make good compost, including leaf and yard waste, laundry lint, lawn clippings, paper filters and other paper products and ashes from the fireplace. Composting does not produce methane, reducing the average-sized family's greenhouse gas emissions by about 880 kg per year. Disposing of organic wastes in landfill sites produces methane if oxygen is not available to help break down the material.**





*Part 11*

# Information Resources

## Ground-Source Heat Pumps

**Earth Energy Society of Canada**
124 O'Connor St., Suite 504
Ottawa ON K1P 5M9
Tel.: (613) 371-3372
Fax: (613) 822-4987
E-mail: Eggerston@EarthEnergy.ca

## Windows

**Siding and Windows Dealers Association of Canada (SAWDAC)**
84 Adam Street
Cambridge ON N3C 2K6
Tel.: 1 800 813-9616 (toll-free)
Fax: (519) 658-4753
Web site: www.sawdac.com

## Information on Standards and Certification Programs

**CSA International**
**Customer Service Department**
178 Rexdale Boulevard
Etobicoke ON M9W 1R3
Tel.: 1 800 463-6727 (toll-free)
Fax: (416) 747-4149
Web site: www.csa-international.org

## Technical Information

**Canadian Construction Materials Centre**
**Product and Materials Evaluation**
**Institute for Research in Construction**
**National Research Council Canada**
Building M-24, 1500 Montreal Road
Ottawa ON K1A 0R6
Tel.: (613) 993-6189
Fax: (613) 952-0268
Web site: www.nrc.ca/ccmc

**Canada Mortgage and Housing Corporation**
700 Montreal Road
Ottawa ON K1A 0P7
Tel.: (613) 748-2000
Fax: (613) 748-2098
Web site: www.cmhc-schl.gc.ca

## Information on Manufacturers, Contractors and Dealers

**Canadian Window and Door Manufacturers Association (CWDMA)**
Web site: www.cwdma.ca

**Insulating Glass Manufacturers Alliance**
27 Goulburn Avenue
Ottawa ON K1N 8C7
Tel.: (613) 233-1510
Fax: (613) 233-1929
Web site: www.igmaonline.org

## Alternative Transportation Fuels

**Propane Gas Association of Canada**
300 5th Avenue South West, Suite 2150
Calgary AB  T2P 3C4
Tel.: (403) 543-6500
Fax: (403) 543-6508
Web site: www.propanegas.ca

**Canadian Natural Gas Vehicle Alliance**
77 Bloor Street West, Suite 1104
Toronto ON  M5S 1M2
Tel.: (416) 961-2339
Fax: (416) 961-1173
Web site: www.ngvcanada.org
E-mail: info@ngvcanada.org

**Canadian Renewable Fuels Association (Ethanol)**
**Head Office**
31 Adelaide Street East
P.O. Box 398
Toronto ON  M5C 2J8
Tel.: (416) 304-1324
Fax: (416) 304-1335
Web site: www.greenfuels.org

## Vehicles

**Canadian Vehicle Manufacturers' Association (CVMA)**
170 Attwell Drive, Suite 400
Etobicoke ON  M9W 5Z5
Tel.: 1 800 758-7122
Fax: (416) 367-3221
Web site: www.cvma.ca

**Association of International Automobile Manufacturers of Canada (AIAMC)**
438 University Avenue
Suite 1618, Box 60
Toronto ON  M5G 2K8
Tel.: (416) 595-8251
Fax: (416) 595-2864
Web site: www.aiamc.com

## Radiant Panels

**Radiant Panel Association**
P.O. Box 717
Loveland CO  80539
U.S.A.
Tel.: (970) 613-0100
1 800 660-7187 (toll-free)
Fax: (970) 613-0098
Web site: www.radiantpanelassociation.org
E-mail: info@rpa-info.com

*Leading Canadians to Energy Efficiency at Home, at Work and on the Road*

The Office of Energy Efficiency of Natural Resources Canada strengthens and expands Canada's commitment to energy efficiency in order to help address the challenges of climate change.

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